SAMSUNG

COLOR TELEVISION RECEIVER

Chassis : S51A
Model: CS29D4NX3X/SAP

SERVICE Manual

COLOR TELEVISION RECEIVER

CONTENTS

1. Precautions
2. Specifications and IC Data
3. Disassembly and Reassembly
4. Alignment and Adjustment
5. Troubleshooting
6. Exploded View and Parts List
7. Electric Parts List
8. Block Diagram
9. PCB Layout Diagram
10. Wiring Diagram
11. Schematic Diagrams

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1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people—particularly children—might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

   If the measured resistance is less than 1.0 megohm or greater than 5.2 megohms, an abnormality exists that must be corrected before the unit is returned to the customer.

4. Leakage Current Hot Check (Figure 1-1):
   Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANIS C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

5. With the unit completely reassembled, plug the AC line cord directly into the power outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: antennas, handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

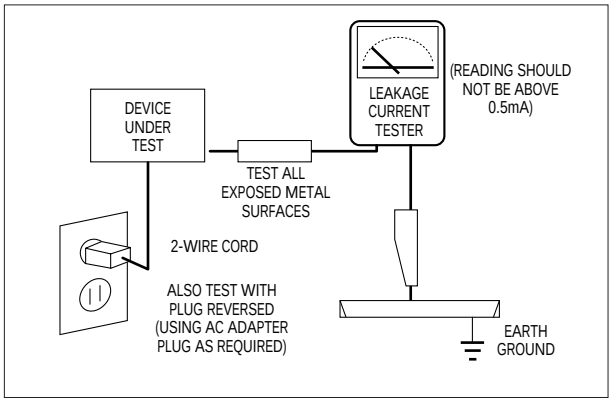

DEVICE UNDER TEST
LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5mA)
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1-1 AC Leakage Test

6. Antenna Cold Check:
   With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. Connect one lead of the ohmmeter to an AC prong. Connect the other lead to the coaxial connector.

7. X-ray Limits:
   The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.

8. High Voltage Limits:
   High voltage must be measured each time servicing is done on the B+, horizontal deflection or high voltage circuits. Correct operation of the X-ray protection circuits must be reconfirmed whenever they are serviced. (X-ray protection circuits also may be called "horizontal disable" or "hold-down".)

   Heed the high voltage limits. These include the X–ray Protection Specifications Label, and the Product Safety and X-ray Warning Note on the service data schematic.

1-1 Safety Precautions (Continued)

9. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

10. Design Alteration Warning:
Never alter or add to the mechanical or electrical design of this unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.

11. Hot Chassis Warning:
Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord. If an isolation transformer is not used, these units may be safely serviced only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC source.

    To confirm that the AC power plug is inserted correctly, do the following: Using an AC voltmeter, measure the voltage between the chassis and a known earth ground. If the reading is greater than 1.0V, remove the AC power plug, reverse its polarity and reinsert. Re-measure the voltage between the chassis and ground.

12. Some TV chassis are designed to operate with 85 volts AC between chassis and ground, regardless of the AC plug polarity. These units can be safely serviced only if an isolation transformer inserted between the receiver and the power source.

13. Some TV chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

14. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.

15. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.

16. Picture Tube Implosion Warning:
The picture tube in this receiver employs "integral implosion" protection. To ensure continued implosion protection, make sure that the replacement picture tube is the same as the original.

17. Do not remove, install or handle the picture tube without first putting on shatterproof goggles equipped with side shields. Never handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; do not try to remove such "permanently attached" yokes from the picture tube.

18. Product Safety Notice:
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original—even if the replacement is rated for higher voltage, wattage, etc.

    Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠).
    Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications.
    A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Servicing Precautions

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.
Warning2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.

2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).

6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

8. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.

2. Immediately before handling any semicon ductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power—this is an electric shock precaution.)

3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.

4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.

5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.

6. Use only an anti-static solder removal device. Many solder removal devices are not rated as “anti-static”; these can accumulate sufficient electrical charge to damage ESDs.

7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2. Specifications and IC Data

2-1 Specifications

Television System:

MODEL	SYSTEM
CI	PAL-I (UHF)
CII	PAL-I (VHF/UHF)
CX	PAL-B/G,SECAM-B/G
CK	PAL-B/G,D/K,SECAM-B/G,D/K
CB	PAL-B/G
CS	PAL-B/G,D/K,SECAM-B/G,D/K,NT4.43,NT3.58

Channels:

SYSTEM / BAND	PAL/SECAM -B/G,I	PAL/SECAM -D/K	SECAM-K1, PAL-D	NTSC-M
VHF	2-12	1-13	2-9	2-13
UHF	21-69	21-69	13-57	14-69

Intermediate-Frequencies(MHz):

SYSTEM / BAND	PAL/SECAM -B/G	PAL/SECAM -D/K,K1	PAL-I	NTSC-M
Picture IF Carrier	38.90	38.90	38.90	38.90
Sound IF Carrier	33.40	32.40	32.90	34.40
Color Sub Carrier	34.47	34.47	34.47	35.32

Picture Tube:

25 Inch	A59KPR84X	Quick start, in-line-gun, Black stripe, 90° degree deflection
29 Inch	A68KVL74X	
30 Inch	A70QBZ791X	

Power Requirements: AC100 ~ 260V, 50/60HZ or AC160 ~ 260V, 50/60HZ

Antenna Input Impedance:
VHF,UHF:Telescopic dipole antenna(75Ω unbalanced type)

Speaker Impedance: 8Ω , 10W + 10W

2-2 IC Line Up

LOC NO	NO	Specification	Description	Remarks
HIC101	1	PAP103T	IF PRE-AMP	
IC201	2	TDA8844	PAL/SECAM/NTSC/SECAM-L	
		TDA8843	PAL/NTSC	
IC301	3	LA7845	VERTICAL DEFLECTION AMP	
IC501	4	TDA6108	RGB DRIVE AMP	
IC601	5	TDA7297	SOUND AMP(10W/CH)	
		TDA7266S	SOUND AMP(5W/CH)	
IC701	6	TDA9859	AUDIO PROCESSOR	
IC801	7	KA3S1265R	SMPS IC(12A)	
IC802	8	PC123Y	PHOTO COUPLER	
IC803	9	78R05	SWITCHING REGULATOR	
IC804	10	KA7630	SWITCHING REGULATOR(5,8V)	
IC901	11	SZM503AT	MICOM	
IC902	12	24C040	EEPROM	
ICE01	13	4558	EW DRIVE AMP	
ICN01	14	TDA9808	SIF DETECTOR	NICAM MODULE
ICN02	15	TDA9874H	NICAM DEMODULATOR	
ICA01	16	LA7567N	SIF DETECTOR	A2 STEREO MODULE
ICA02	17	TDA9873H	A2 DEMODULATOR	
ICM01	18	LA7566	SIF & FM DETECTOR	MONO
ICP01	19	TEA5114	VIDEO SWITCH	PIP MODULE
ICP02	20	TDA9160A	PAL/NTSC DECODER	
ICP03	21	SDA9288	PIP VIDEO PROCESS	
ICT01	22	SAA5261	TTX-DECODER	TTX MODULE
ICT02	23	24C02	EEPROM(TTX PAGE MEMORY)	

2-3 Semiconductor Base Diagrams

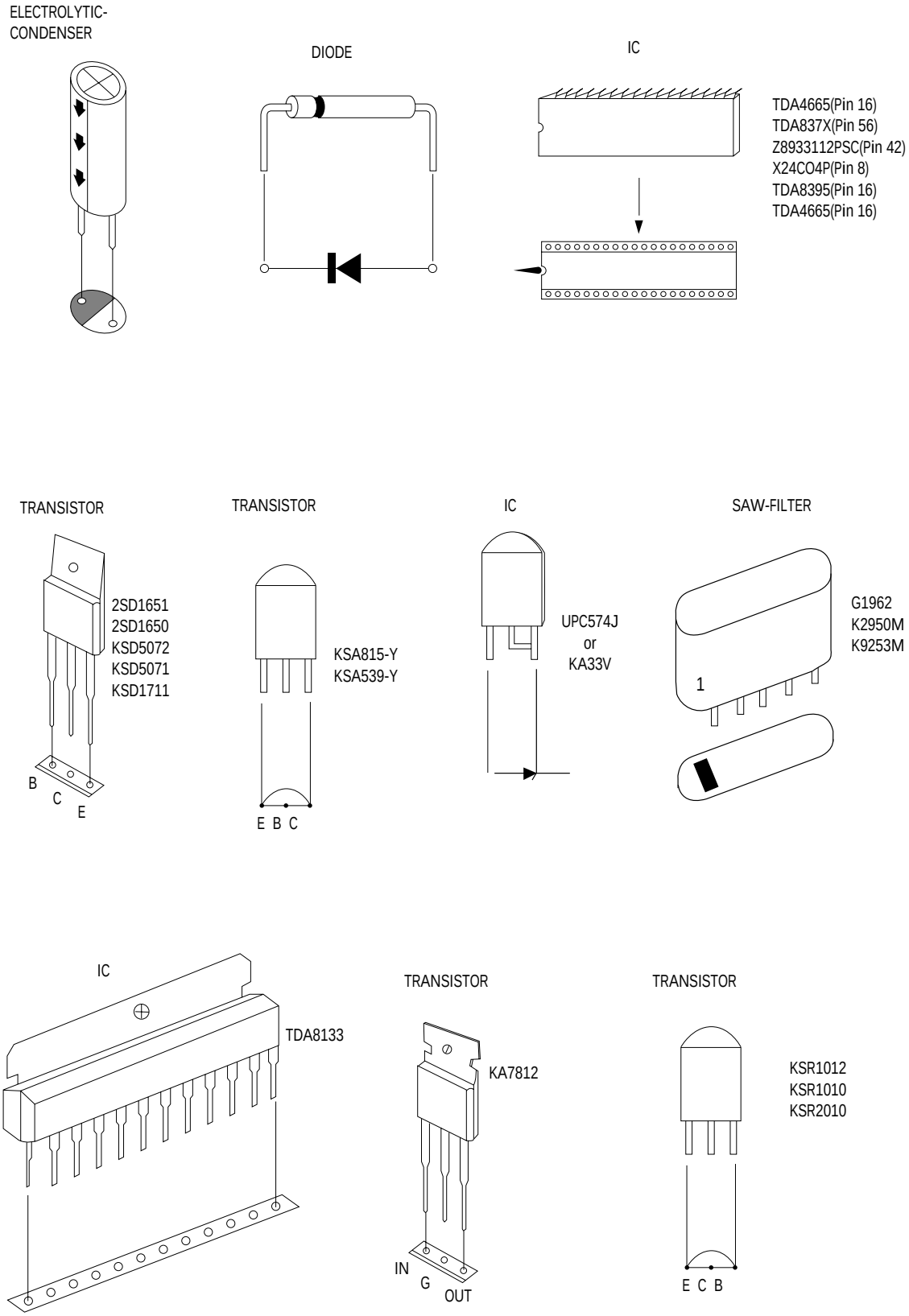
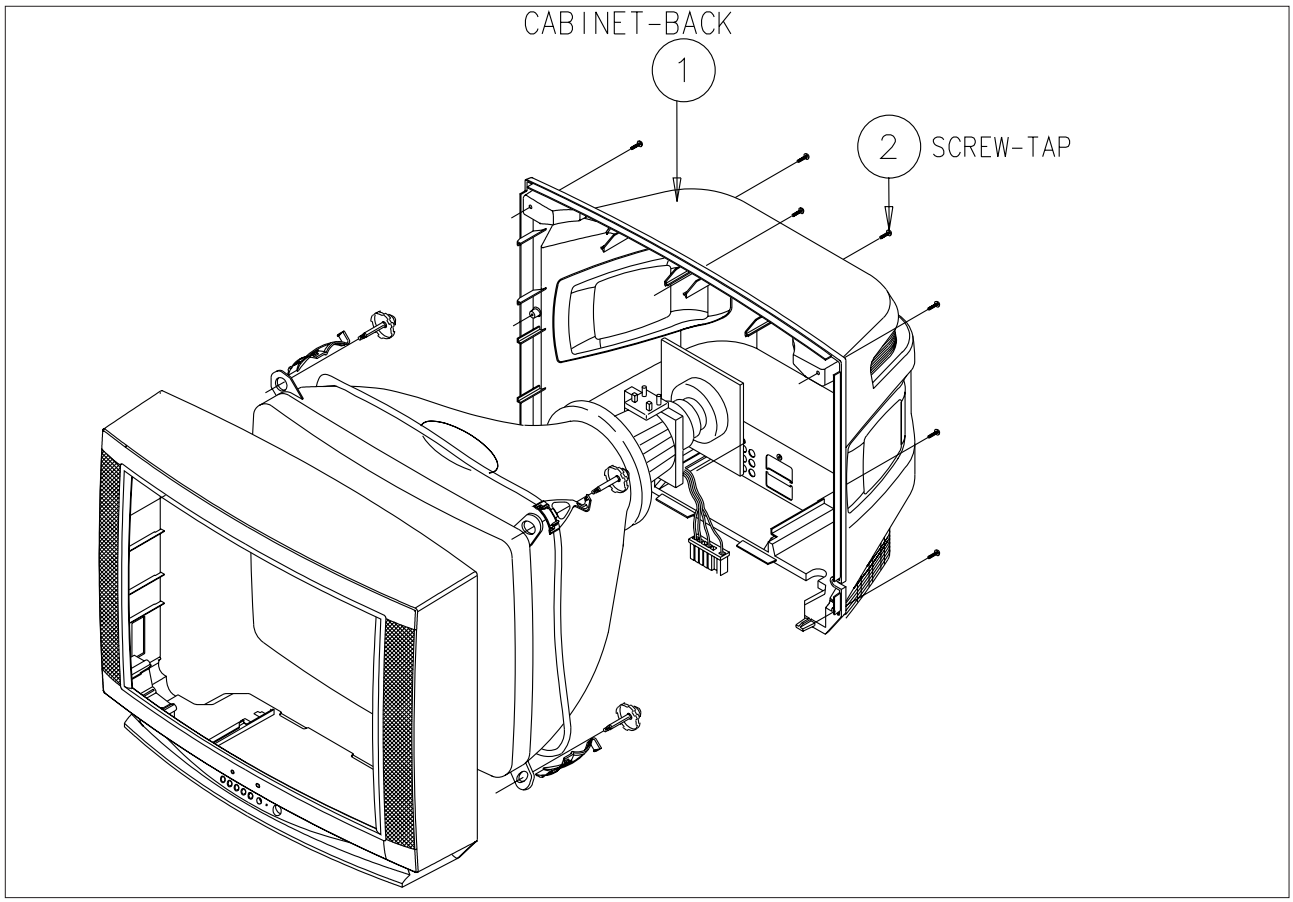


Fig. 2-1 Semiconductor Base Diagrams

MEMO

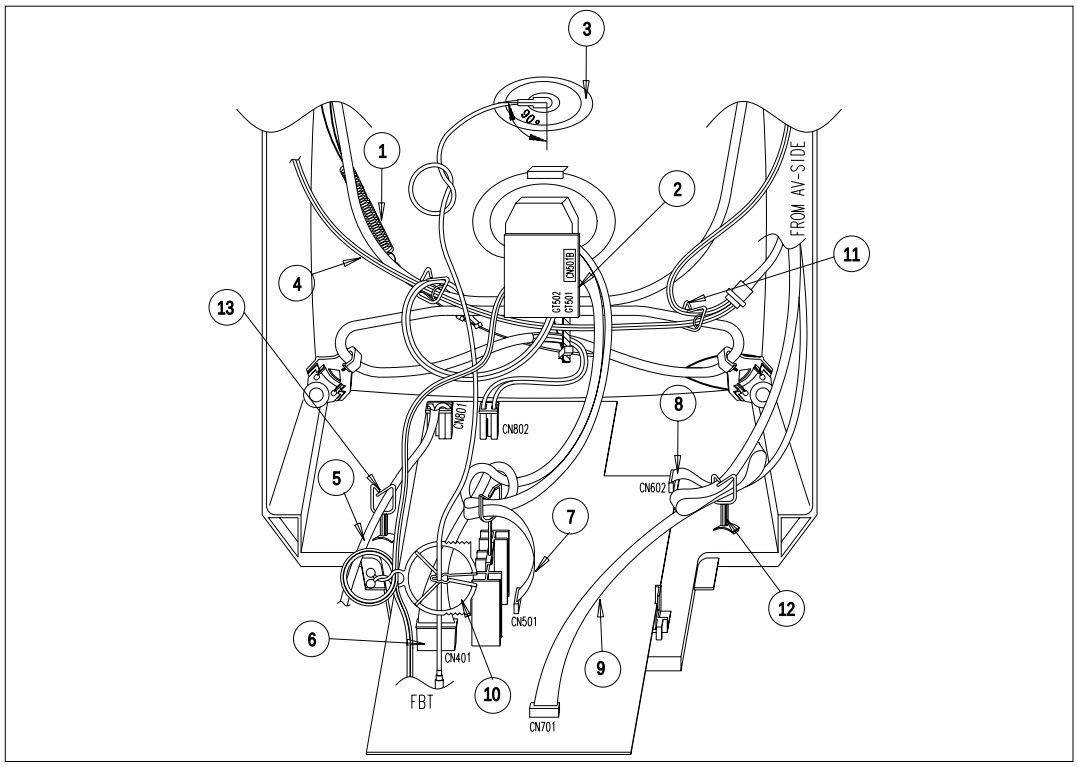
3. Disassembly and Reassembly

3-1 Back Cover Removal



1. After removing the 7 screws, pull the cabinet backwards.

3-2 Main Board Removal



1. Separate the TBC-wire 2P connector from GT501,GT502.

2. Separate the CRT Assay from the CRT socket.

3. Remove the Anode Cap from the CRT.

4. Separate the D-Coil Connector from CN802.

5. Separate the AC cord from CN801.

6. Separate the DC connector from CN401.

7. Separate the CN501B 8P CRT connector from CN501.

8. Separate the CNA05 5P A/V side connector from CN602.

9. Separate the CNA01 8P CRT connector from CN701.

10. Separate the Focus,Screen Wire from the FBT clamper.

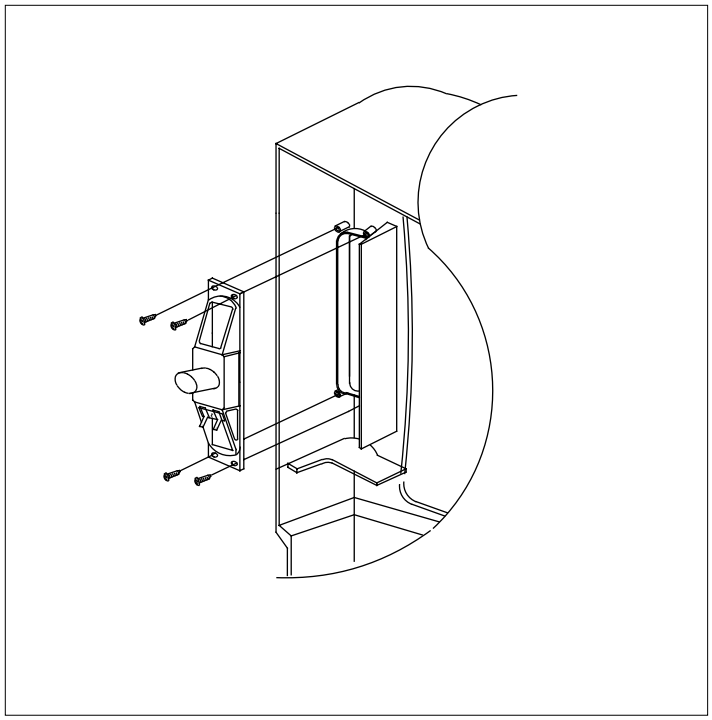
11. Separate the TBC wire 2P, speaker wires from the wire clamper.

12. Separate the CN701, CN602 connector from the wire clamper.

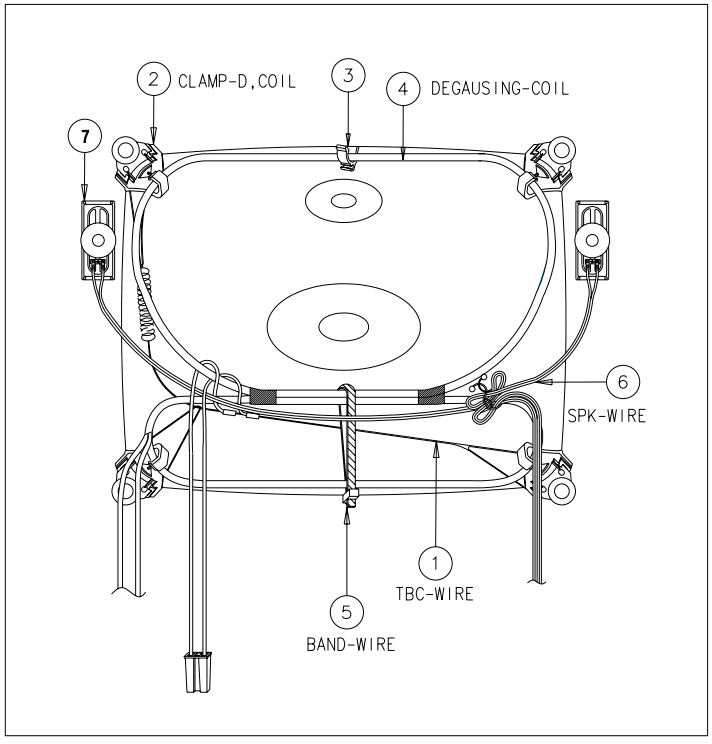
13. Separate the AC cord from the wire clamper.

14. Remove the main board by pulling it with both hands.

3-3 Speaker Removal



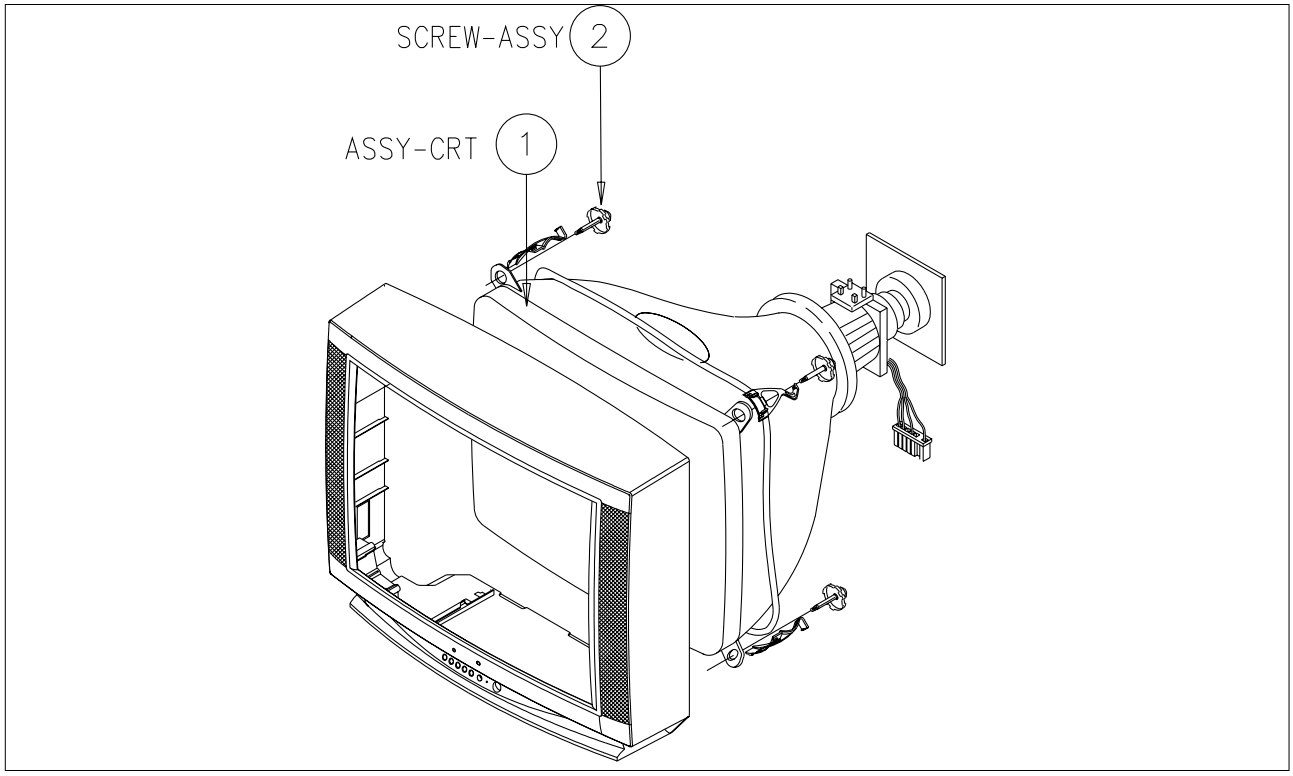
1. Remove the speaker by pressing the tension rib.



1. Separate the speaker wires from D-coil (located on the bottom to the right side).

2. Remove the screws.

3-4 CRT Removal



1. Remove the 4 nuts mounting the CRT to the front cabinet.
   Pull the CRT backwards.

2. Caution: Because of the high vacuum and large surface area of the picture tube, be careful while handling it: (1) Always lift the picture tube by grasping it firmly around the faceplate, (2) Never lift the tube by its neck. (3) Do not scratch the picture tube or apply excessive pressure. Fractures of the glass may cause an implosion.

4. Alignment and Adjustments

4-1 Preadjustment

4-1-1 Factory Mode

1. Do not attempt these adjustments in the Video Mode.

2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.

3. Do not tamper with the "Adjustment" screen of the Factory Mode menu. This screen is intended only for factory use.

4-1-2 When EEPROM (IC902) Is Replaced

1. When IC902 is replaced all adjustment data revert to initial values. It is necessary to re-program this data.

2. After IC902 is replaced, warm up the TV for 10 seconds.

4-1-3 When CRT Is Replaced

1. Make the following adjustments AFTER setting up after setting up purity and convergence :

   White Balance
   Sub-Brightness, Sub-Contrast
   Vertical Center
   Vertical Size
   Horizontal Size
   Fail Safe (This adjustment must be the last step).

4-2 Factory/Service Mode

4-2-1 Procedure for the "Adjustment" Mode

1. This mode uses the standard remote control. The Service Mode is activated by entering the following remote-control sequence :

   (1) STAND-BY→ DISPLAY→ MENU→ MUTE →POWER ON.

2. The "SERVICE (FACTORY)" message will be displayed. The Service Mode has four components: Adjustment, Test Pattern, Option Bytes and Reset.

3. Access the Adjustment Mode by pressing the "VOLUME" keys (Up or Down). The adjustment parameters are listed in the accompanying table, and selected by pressing the CHANNEL keys (▲ ,▼).

4. Selection sequences for the PAL/NTSC system:

   DOWN or UP key:

   AGC↔VCO↔SBT↔SCT↔SCR↔SC↔RG↔
   BG↔CDL↔STT↔PDL↔VOL↔PSL↔PVS↔
   PVA↔PHS↔PEW↔PEP↔PEC↔PET↔VSC↔
   TSC↔SA↔QEW↔PCT↔PTT↔PHM↔PVP↔
   NVP↔PHP↔NSR↔FFI↔AGC.

5. The VOLUME keys increase or decrease the adjustment values (stored in the non-volatile memory) when Adjustment Mode is cancelled.

6. Cancel the Adjustment Mode by re-pressing the "HIDDEN" or "Power OFF/ON" keys.

4-2-2 Main Adjustment Parameters

OSD	FUNCTION	RANGE
AGC	AUTO GAIN CONTROL	0 ~ 63
VCO	VOLTAGE CONTROLLED OSCILLATOR	0 ~127
SBT	SUB BRIGHT	0 ~ 23
SCT	SUB CONTRAST	0 ~ 23
SCR	SUB COLOR	0 ~ 23
SC	S-CORRECTION	0 ~ 63
RG	RED DRIVE GAIN	0 ~ 63
BG	BLUE DRIVE GAIN	0 ~ 63
CDL	CATHODE DRIVE LEVEL	0 ~ 7
STT	SUB TINT	0 ~ 13
PDL	PAL DELAYTIME	0 ~ 15
VOL	VOLUME LEVEL	0 ~100
PSL	PAL VERTICAL SLOP	0 ~ 63
PVS	PAL VERTICAL SHIFT	0 ~ 63
PVA	PAL VERTICAL AMPLITUDE	0 ~ 63
PHS	PAL HORIZONTAL SHIFT	0 ~ 63
PEW	PAL EW-WIDTH	0 ~ 63
PEP	PAL EW-PARABOLA	0 ~ 63
PEC	PAL EW-CORNER PARABOLA	0 ~ 63
PET	PAL EW-TRAPEZIUM	0 ~ 63
VSC	VERTICAL SCROLL	0 ~ 63
TSC	TTX SUB CONTRAST	0 ~ 63
SA	SEPARATION ADJUSTMENT	0 ~ 14
QEW	Q EW-WIDTH	0 ~ 15
PCT	PIP CONTRAST	0 ~ 15
PTT	PIP TINT	0 ~ 63
PHM	PIP HORIZENTAL MOVE	0 ~ 15
PVP	PIP PAL VERTICAL POSITION	0 ~63
NVP	PIP NTSC VERTICAL POSITION	0 ~ 63
PHP	PIP HORIZENTAL POSITION	0 ~ 63
NSR	NTSC SUB COLOR	0 ~ 23
FFI	FAST FILTER IF-PLL	0 ~ 1

FACTORY MODE VALUE

OSD	INITIAL	OSD	INITIAL	OSD	INITIAL
2 (CH)		PDL	0(FIXED)	TSC	40
AGC	18(FIXED)	VOL	25(FIXED)	SA	25(FIXED)
VCO	80(FIXED)	PSL	31(FIXED)	QEW	5
SBT	7	PVS	31	PCT	7(FIXED)
SCT	16	PVA	31	PTT	31(FIXED)
SCR	5(FIXED)	PHS	40	PHM	8(FIXED)
SC	11(FIXED)	PEW	38	PVP	31(FIXED)
RG	31	PEP	22	NVP	31(FIXED)
BG	31	PEC	22	PHP	42(FIXED)
CDL	7(FIXED)	PET	30	NSR	3(FIXED)
STT	10(FIXED)	VSC	31(FIXED)	FFI	1:INDIA,0:OTHERS

4-2-3 Test Pattern

1. This mode can be used during servicing, or for confirming that the convergence and purity adjustments are correct.

2. Access the Test Pattern parameters by pressing a CHANNEL keys (▲ ,▼) while the Service Mode is on. The cursor will move to the test pattern. Press the VOLUME keys. On-screen display:

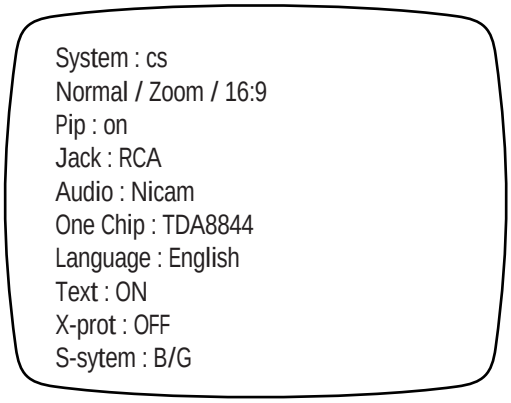
   • RED
   • GREEN
   • BLUE
   • WHITE

3. AGING Mode (Reference Only)

   This pattern is used for pre-heating the CRT during manufacturing--it is accessed in the factory by twice pressing the “HIDDEN “ key.

   Even if the TV power is cut off, the Aging Mode is not cancelled, The AGING mode is cancelled by repressing the “HIDDEN” or any key on the front pannel.

4-2-4 Option Byte Table



OPTION	OSD	NOTE
SYSTEM	CS	MULTI SYSTEM
	CS-CHINA	WITHOUT SECAM SYSTEM
	CB/CII	PAL-B/G & PAL-I
	CK/CX	PAL/SECAM B/G,D/K
	NORMAL/ZOOM / 16:9	SELECT A MODE AVAILABLE TO ADJUST P-SIZE
	PLUS/ZOOM	
	NORMAL/ZOOM	
	PLUS/NORMAL	
	PLUS/NORMAL/ZOOM/16:9	
PIP	ON	PIP USED
	OFF	PIP DELETED
JACK	SCART	21PIN JACK USED
	RCA	RCA JACK USED
AUDIO	NICAM	NICAM MODULE USED
	STEREO	A2 MODULE USED
	L-STEREO	MONO & LINE STEREO USED
	MONO	MONO USED
ONE CHIP	TDA8844	CRT (MORE THAN 22-INCH) USED
	TDA8842	CRT (MORE THAN 21-INCH) USED

OPTION	OSD	NOTE
LANGUAGE	ENGLISH	ENGLISH ONLY
	ARAB	ENGLISH / ARABIAN
	PERSIAN	ENGLISH / PERSIAN
	FRANCH	ENGLISH / FRENCH
	CHINA	ENGLISH / CHINESE
	INDONESIA	ENGLISH / INDONESIAN
	MALAYSIA	ENGLISH / MALAYSIAN
	THAI	ENGLISH / THAI
	VIETNAM	ENGLISH / VIETNAMESE
	ARAB/FRANCH	ENGLISH / ARABIAN / FRENCH
	MULTI	ENGLISH / ARABIAN / PERSIAN / FRENCH / CHINESE / INDONESIAN / MALAYSIAN/ THAI / VIETNAM
TEXT	ON	TTX USED
	OFF	TTX DELETED
X-PROT	ON	X-RAY PROTECTOR USED
	OFF	NO X-RAY PROTECTOR FUNCTION
S-SYSTEM	B/G	1.THE SOUND SYSTEM COMES FIRST IN AUTO SEARCH 2.SOUND SYSTEM IN FACTORY MODE RESET 3."AUTO" MODE IS SHOWN ONLY WHEN L-STEREO OR MONO IS SELECTED IN THE AUDIO MODE.
	I	
	D/K	
	M	
	AUTO	

4-2-5 RESET

The Reset Mode is used during factory inspection.
Function Reset:

1.	Channels	Add/Erase
2.	Language	Basic (English)

4-3 Other Adjustments

4-3-1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. The picture should have good black and white details. There should be no objectionable color shading; if color shading is present, perform the purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent.

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

4-3-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 30 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

4-3-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to +130 volts (Full color bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.
2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).
3. The high voltage should not exceed 33KV.
4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 33KV under any conditions.

4-3-4 FOCUS Adjustment

1. Input a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-3-5 Screen Adjustment

1. Connect CRT socket pin GK, BK, RK to an oscilloscope probe.
2. Input a gray scale pattern. (Use a pattern generator, PM5518)
3. Use the Picture mode for the STANDARD picture.
4. Adjust the Screen VR (on the FBT) so that the voltage on the oscilloscope becomes 130±2.5V (See Fig. 4-1).

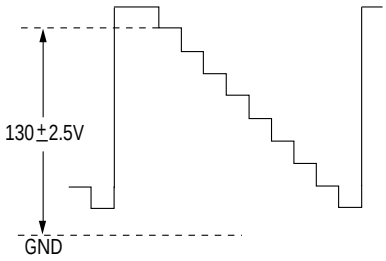


Fig. 4-1

4-3-6 Purity Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Plug in the CRT deflection yoke and tighten the clamp screw.
3. Plug the convergence yoke into the CRT and set in as shown in Fig. 4-2.
4. Input a black and white signal.
5. Fully demagnetize the receiver by applying an external degaussing coil.
6. Turn the CONTRAST and BRIGHTNESS controls to maximum.
7. Loosen the clamp screw holding the yoke. Slide the yoke backward or forward to provide vertical green belt. (Fig. 4-3).
8. Tighten the convergence yoke.
9. Slowly move the deflection yoke forward, and adjust for the best overall green screen.
10. Temporarily tighten the deflection yoke.
11. Produce blue and red rasters by adjusting the low-light controls. Check for good purity in each field.
12. Tighten the deflection yoke.

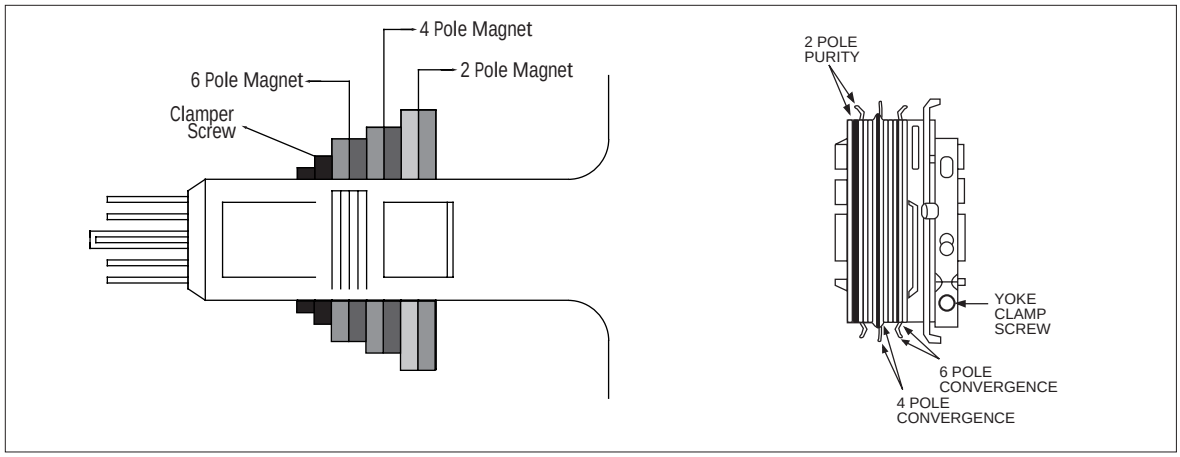


Fig. 4-2 Convergence Magnet Assembly

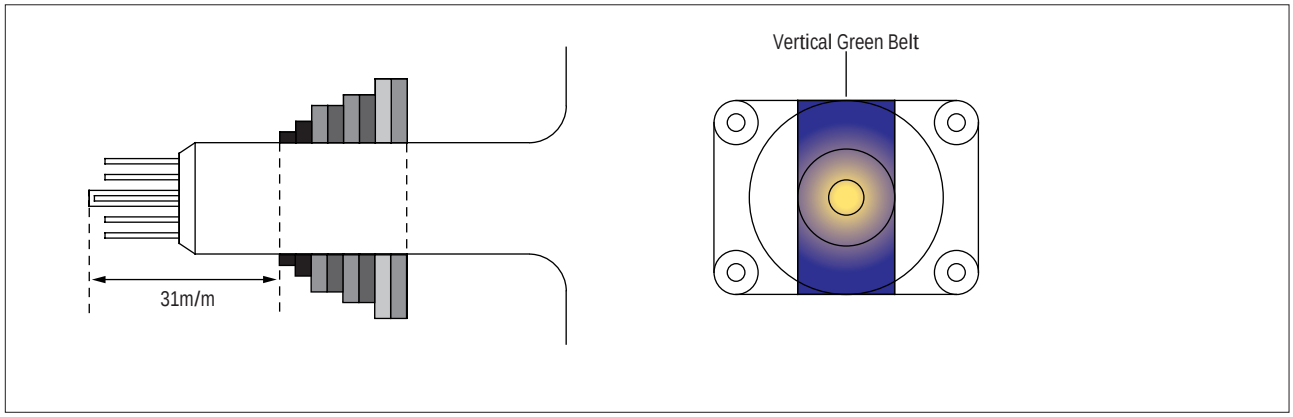


Fig. 4-3 Center Convergence Adjustment

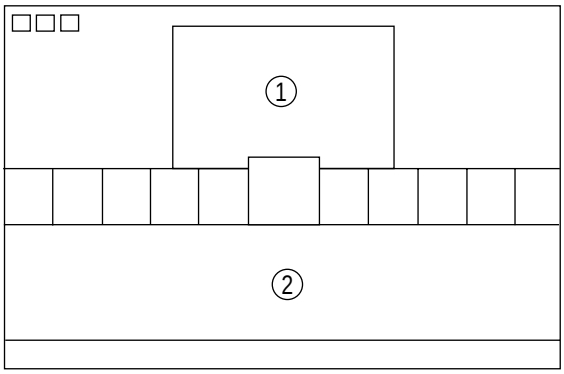


Fig. 4-4

4-3-7 White Balance Adjustment

(a) Set up

1. Warm up the TV for at least 30 minutes in the White Pattern.
2. Input a Toshiba pattern.

(b) High-Light Adjustment

Set SCT to 50 ± 5 fL in the Factory Service Mode with using CA100. (See Fig. 4-4 ①)

(c) Low-Light Adjustment

Set SBT to 1.2 ± 0.2 fL in the Factory Service Mode with using CA100. (See Fig. 4-4 ②)

4-3-8 Center Convergence Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Adjust the two tabs of the 4 pole magnets to change the angle between them. Superimpose the red and blue vertical lines in the center area of the screen.
3. Adjust the Brightness and Contrast controls for a well defined picture.
4. Adjust the two-tab pairs of the 4 pole magnets, and change the angle between them. Superimpose the red and the blue vertical lines in the center area of the screen.
5. Turn the both tabs at the same time, keeping the angle constant, and superimpose the red and blue horizontal line in the center of the screen.
6. Adjust the two-tab pairs of the 6-pole magnets to superimpose the red and blue line onto the green. (Changing the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.)
7. Repeat adjustments 2~6, if necessary.
8. Since the 4-pole magnets and 6-pole magnets interact, the dot movement is complex (Fig. 4-5).

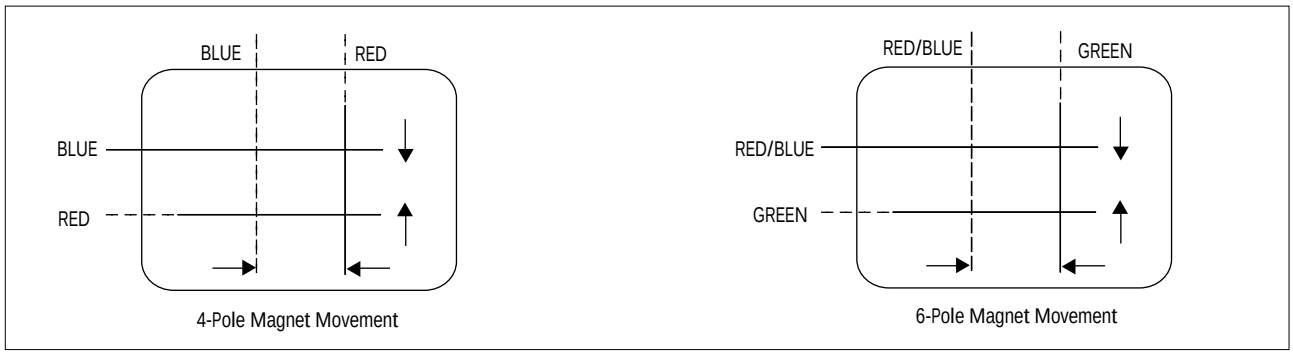


Fig. 4-5 Center Convergence Adjustment

4-3-9 RF AGC Adjustment

1. Tune to the strongest local station.
2. Enter the Factory Service Mode to make adjustments.
3. Adjust the AGC control untill noise(snow) disappears from the screen.

4-3-10 Geometry Adjustment

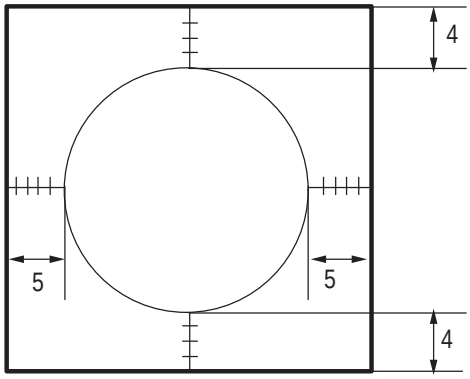
1. Input a lion head pattern.

2. Adjust PVS so that the picture is vertically centered.

3. Adjust with PVA so that the top and bottom margins of the picture are 4.

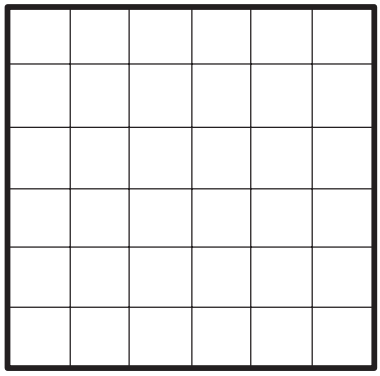
4. Adjust PHS so that the picture is horizontally centered.

5. Adjust with PEW so that the left and right margins of the picture are 5.



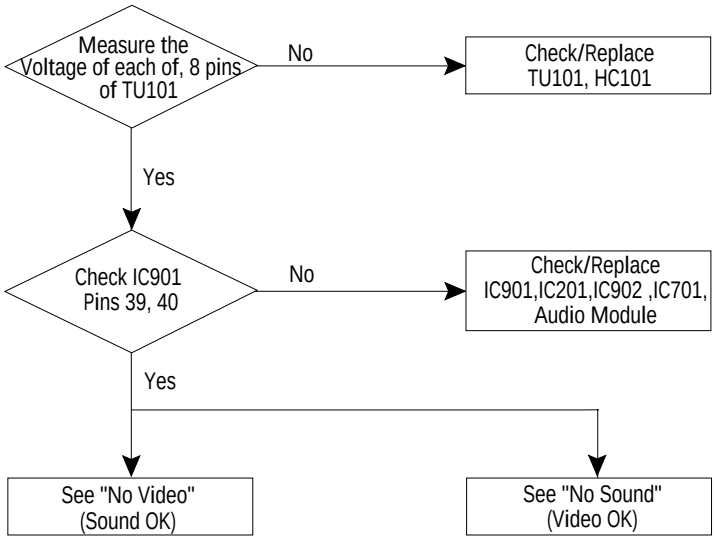
6. Input a crosshatch pattern.

7. Adjust PEP, PEC , PET for vertical linearity.

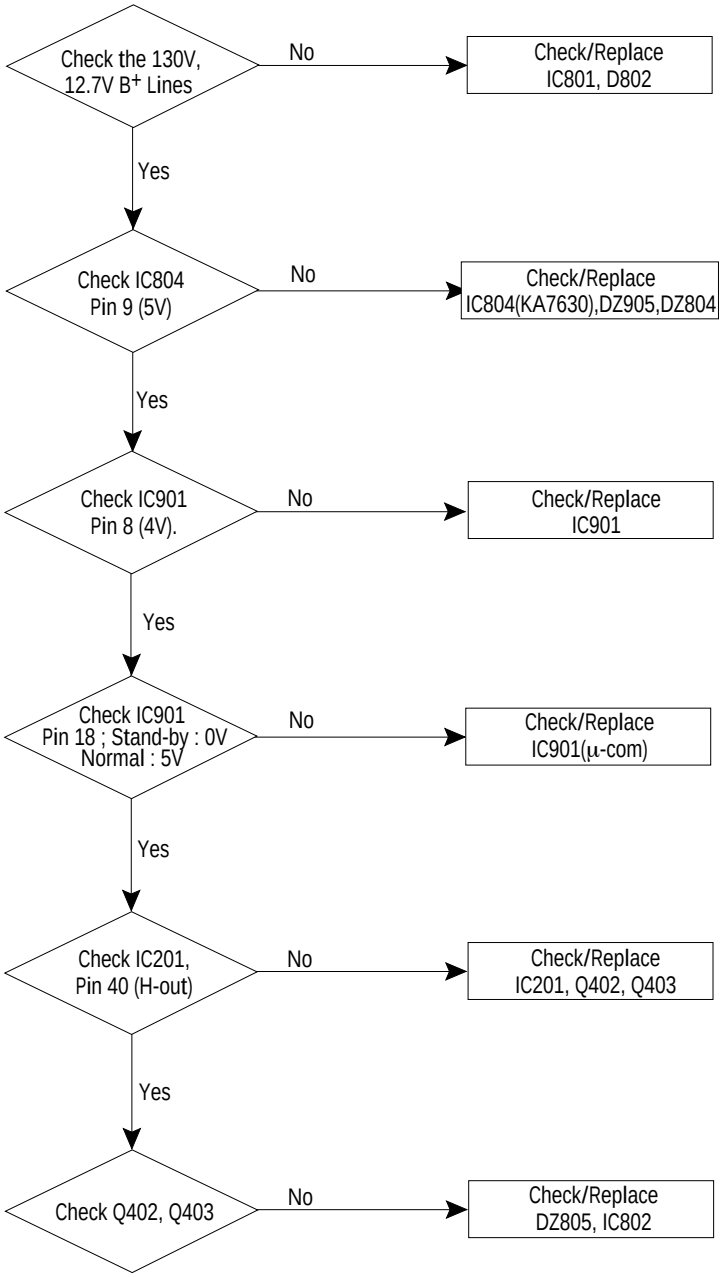


5. Troubleshooting

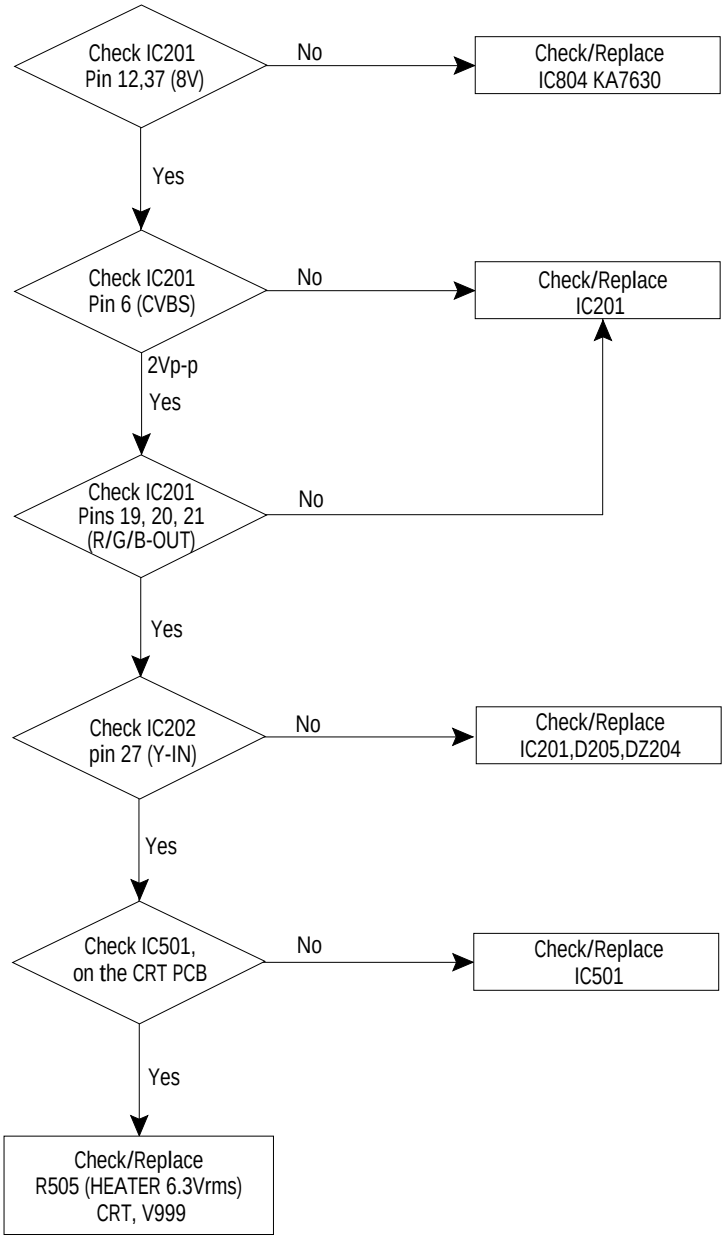
5-1 No Video (Raster On, No Sound)



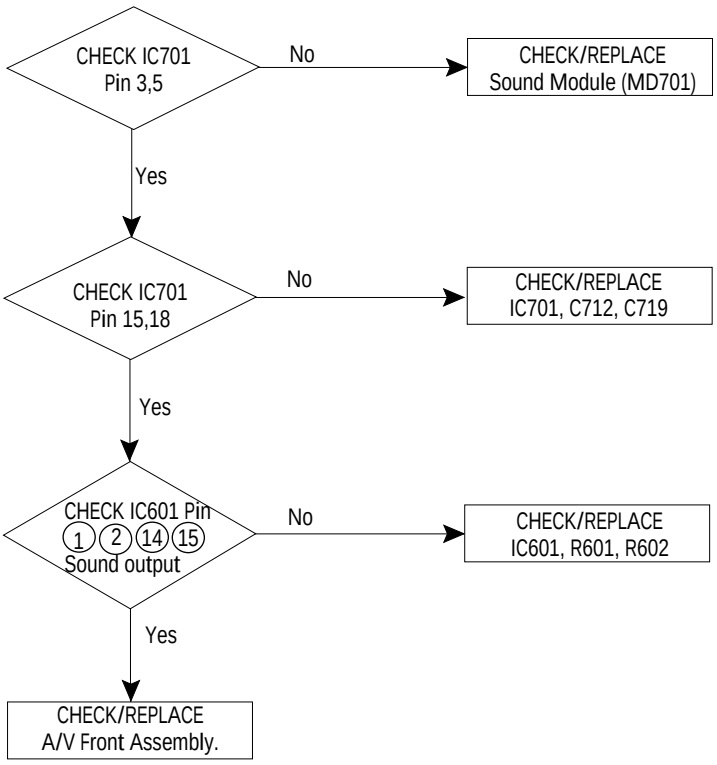
5-2 No Power


Check the 130V, 12.7V B+ Lines
No
Check/Replace IC801, D802
Yes
Check IC804 Pin 9 (5V)
No
Check/Replace IC804(KA7630),DZ905,DZ804
Yes
Check IC901 Pin 8 (4V).
No
Check/Replace IC901
Yes
Check IC901 Pin 18 ; Stand-by : 0V Normal : 5V
No
Check/Replace IC901(μ-com)
Yes
Check IC201, Pin 40 (H-out)
No
Check/Replace IC201, Q402, Q403
Yes
Check Q402, Q403
No
Check/Replace DZ805, IC802

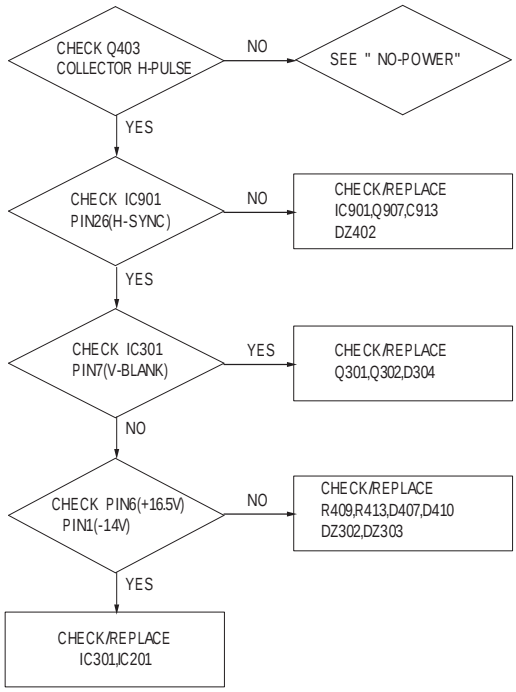
5-3 No Video (Sound OK)



5-4 No Sound (Video OK)



5-5 Power OFF/ON (Repeatedly)



5-6 SMPS (Power Supply) Does Not Function

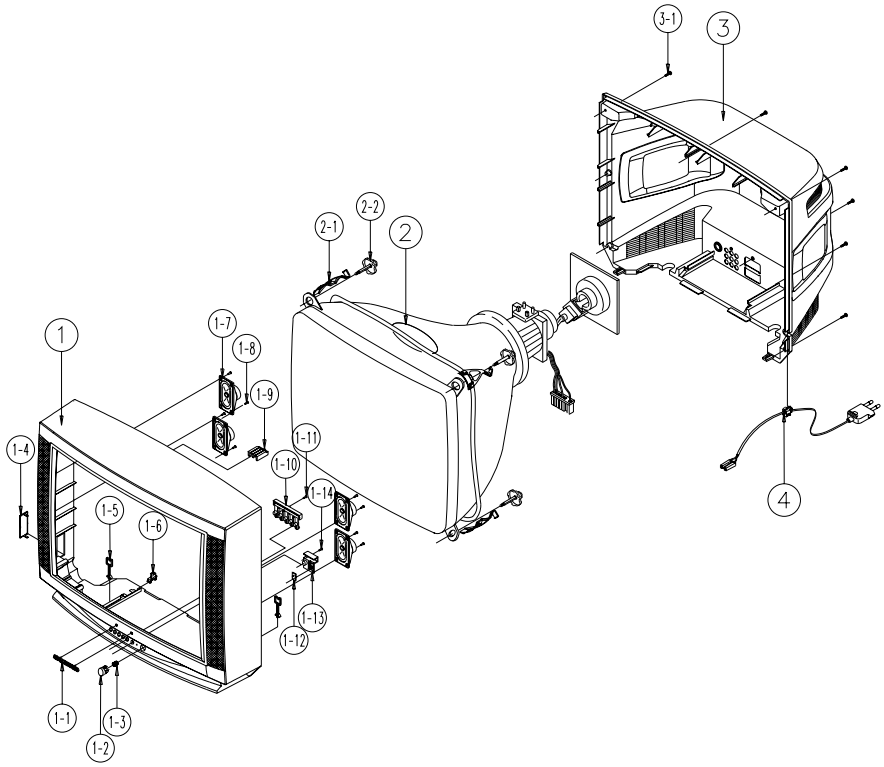
(1) When F802 is open:
Check/Replace F802 , IC801 , D802.

(2) When F802 is okay, but SMPS does not function:
Check/Replace DZ801 , DZ808 , IC802 , DZ805.

(3) Others: See "5. Troubleshooting"

6. Exploded View & Parts List

6-1 CS29D4NX3X/SAP



No	Code No	Description	Specification	Q'ty	Remark
1	AA91-10385D	ASSY-C/FRONT	-,CS29D4NX,(SPK)DG703P,HB,BLK	1	
	AA64-31265G	CABINET-FRONT	-,CS29D4NX,DG703P EGH,HIPS,HB,	1	
1-1	AA64-70011D	BADGE-BRAND	AL,SS R2000 25,GOLD,L60,-,-,-	1	
1-2	AA64-10782C	KNOB-POWER	-,254,294,299D,M/S,ABS,HB,G367	1	
1-3	AA61-60003J	SPRING-CS	-,SUS304,0.5,OD6,H12,N7,-,-,-	1	
1-4	AA95-90035K	ASSY-PCB,A/V SIDE	-,CS254D,S51A,PAL,W/O WOOFER,-	1	
1-5	AA65-30105A	CLAMP-WIRE	NYLON 66,V2,NTR,15MM,ALL MODEL	2	
1-6	AA61-40113A	STOPPER-PCB	501H,HIPS,NTR,HB,-,-	1	
1-7	3001-001072	SPEAKER	5W,16ohm,90dB,180Hz	4	
1-8	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	8	
1-9	AA61-40114A	BOSS-CABINET	TVI,HIPS,HB,WHITE,-,-	1	
1-10	AA64-10783A	KNOB-CONTROL	-,254,294,294D,G3676,ABS,HB,GR	1	
1-11	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	1	
1-12	AA64-40506A	INDICATOR-LED	-,294,299D,-,ACRYL,HB,CLR,-	1	
1-13	AA64-40505A	WINDOW-RMC	-,294D,-,ABS,HB,LG41338,-	1	
1-14	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	1	
2	AA03-10031U	CRT-COLOR	-,A68KVL74X01(M),-200mG,29,11	1	
2-1	AA65-30113A	CLAMP-D,COIL	NYLON 66,V2,BLK,TVI 25~29,-,-	4	
2-2	AA60-10050Q	SCREW-ASSY	WC,HH,+,M5,L26.5,SWRCH18A,ZPC(	4	
3	AA64-31266C	CABINET-BACK	-,294D,-,HIPS,VO,G3119,-,-	1	
3-1	AA60-10050T	SCREW-TAPPING	RH,+,2S,M4,L20,ZPC(BLK),SWRCH1	7	
4	AA61-20050A	HOLDER-CORD	-,-,PP,V0,BLK,DO	1	

7. Electric Parts List

7-1 CS29D4NX3X/SAP Parts List

ASSY-PCB,MAIN(OPT)

BUYER : SAPL

Loc. No.	Code No.	Description ; Specification	Remark
*	AA94-00035A	ASSY-PCB,MAIN(OPT);CS29D4NX3X/SAP,S51A,SINGA	
C102	2401-002594	C-AL;220uF,20%,16V,GP,TP,8x11.5,5	
C103	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C104	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C105	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C106	2401-001082	C-AL;330nF,20%,50V,GP,TP,5x11,5	
C107	2401-000914	C-AL;22uF,20%,16V,GP,TP,5x11,5	
C109	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C110	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C111	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C207	2401-001026	C-AL;3.3UF,20%,50V,GP,TP,5X11,5	
C209	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C210	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C211	2401-002619	C-AL;47uF,20%,25V,GP,TP,5x11,5	
C213	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C214	2401-000660	C-AL;2.2uF,20%,50V,GP,TP,5x11,5	
C215	2305-000412	C-FILM,MPEF;470nF,5%,63V,TP,-,5mm	
C216	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C217	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C218	2305-000411	C-FILM,MPEF;470nF,5%,50V,TP,7.3x4.8x5.5mm,	
C219	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
C220	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C221	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C222	2305-000412	C-FILM,MPEF;470nF,5%,63V,TP,-,5mm	
C223	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C224	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C225	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C226	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C227	2201-000986	C-CERAMIC,DISC;12pF,5%,50V,NPO,TP,5x3mm,2.5mm	
C228	2201-000273	C-CERAMIC,DISC;18pF,5%,50V,CH,TP,5x3mm,5	
C229	2301-000356	C-FILM,PEF;47nF,5%,50V,TP,7.5x4.0x6.5,5mm	
C230	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C231	2202-000183	C-CERAMIC,MLC-AXIAL;2.2NF,20%,16V,Y5R,TP,3.5X1.9MM,	
C232	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C233	2309-000138	C-FILM,PE-PPF;100nF,5%,50V,TP,20x16x8.5,7.5m	
C234	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C235	2202-000849	C-CERAMIC,MLC-AXIAL;18pF,5%,50V,CH,TP,3.5x1.9,-	
C236	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C237	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C238	2301-000383	C-FILM,PEF;10nF,5%,50V,TP,6x7x3.2mm,5mm	
C239	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
C240	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C241	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11,5	
C242	2202-000183	C-CERAMIC,MLC-AXIAL;2.2NF,20%,16V,Y5R,TP,3.5X1.9MM,	
C243	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11,5	
C244	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C245	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C301	2301-000254	C-FILM,PEF;39nF,5%,50V,TP,7.5x3.5x6.5mm,5	
C302	2401-000360	C-AL;100uF,20%,50V,GP,TP,8x11.5,5	
C303	2201-000259	C-CERAMIC,DISC;180pF,10%,500V,Y5P,TP,6x4,5	
C304	2305-000285	C-FILM,MPEF;220nF,5%,100V,TP,20x18x11.5,15	
C305	2305-000149	C-FILM,MPEF;100nF,5%,100V,TP,12x12.5x6.5,5	
C306	2305-000149	C-FILM,MPEF;100nF,5%,100V,TP,12x12.5x6.5,5	
C307	2401-000326	C-AL;100uF,20%,35V,GP,TP,8x11.5,5	
C308	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C309	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C403	2401-000901	C-AL;22uF,20%,160V,GP,TP,10x20,5	
C404	2201-000291	C-CERAMIC,DISC;1nF,10%,500V,Y5P,TP,8.5x5MM,5	
C405	2401-002268	C-AL;2.2uF,20%,250V,LZ,TP,8X11,5	
C406	2306-000272	C-FILM,MPPF;820nF,5%,400V,BK,29x25.5x18.5,	
C407	2201-000984	C-CERAMIC,DISC;680pF,10%,2KV,Y5P,TP,11x6,7.5m	
C408	2305-000382	C-FILM,MPEF;4.7nF,5%,400V,TP,-,5mm	
C409	2201-000551	C-CERAMIC,DISC;470pF,10%,1KV,Y5P,TP,8x5,5	
C410	2401-001397	C-AL;470uF,20%,25V,GP,TP,10x16,5	
C411	2305-000178	C-FILM,MPEF;10nF,5%,100V,TP,-,5mm	
C412	2201-000599	C-CERAMIC,DISC;560pF,10%,500V,Y5P,TP,7x4,5	
C413	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C414	2306-000267	C-FILM,MPPF;8.2nF,5%,1.6KV,TP,28.5x18.5x12	
C415	2306-000267	C-FILM,MPPF;8.2nF,5%,1.6KV,TP,28.5x18.5x12	
C416	2303-001026	C-FILM,PPF;33nF,10%,400V,TP,20x15x8,7.5	
C417	2306-000102	C-FILM,MPPF;1.2uF,5%,250V,TP,29*31*14.5,20	
C418	2201-000556	C-CERAMIC,DISC;470pF,10%,500V,Y5P,TP,7x4,5	
C419	2401-001397	C-AL;470uF,20%,25V,GP,TP,10x16,5	
C421	2401-002619	C-AL;47uF,20%,25V,GP,TP,5x11,5	
C422	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C423	2201-000556	C-CERAMIC,DISC;470pF,10%,500V,Y5P,TP,7x4,5	
C424	2401-001527	C-AL;47uF,20%,250V,HR,TP,13x25mm,5m	
C425	2305-000154	C-FILM,MPEF;100nF,5%,400V,TP,21.5x6.5x11.5	
C427	2201-000984	C-CERAMIC,DISC;680pF,10%,2KV,Y5P,TP,11x6,7.5m	
C504	2202-000862	C-CERAMIC,MLC-AXIAL;390pF,10%,50V,Y5P,TP,3.5x1.9,-	
C506	2301-000213	C-FILM,PEF;220nF,5%,250V,TP,21.5x11,7.5	
C510	2401-000430	C-AL;10uF,20%,250V,GP,TP,10x16mm,5m	
C520	2401-001232	C-AL;4.7uF,20%,250V,GP,TP,10x12.5,5	
C530	2201-002063	C-CERAMIC,DISC;10nF,+80-20%,3KV,Y5V,TP,16x5,7	
C601	2401-001914	C-AL;1uF,20%,50V,BP,TP,5x11,5	
C602	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
C603	2401-001333	C-AL;470nF,20%,50V,GP,TP,5x11,5	
C604	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C605	2401-001914	C-AL;1uF,20%,50V,BP,TP,5x11,5	
C606	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
C607	2401-001998	C-AL;1000uF,20%,25V,GP,TP,10x20,5mm	
C701	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C702	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
C703	2201-000483	C-CERAMIC,DISC;33pF,5%,50V,CH,TP,5x3,5	
C705	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C707	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C709	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C710	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C711	2401-002235	C-AL;10uF,20%,16V,GP,TP,5x11mm,5mm	
C712	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C713	2301-000247	C-FILM,PEF;33nF,5%,50V,TP,8.1x4.5x13mm,5m	
C714	2301-000289	C-FILM,PEF;5.6nF,5%,50V,TP,7x6x3,5	
C715	2401-000647	C-AL;2.2uF,20%,50V,BP,TP,5x11,5	
C716	2401-000647	C-AL;2.2uF,20%,50V,BP,TP,5x11,5	
C717	2301-000289	C-FILM,PEF;5.6nF,5%,50V,TP,7x6x3,5	
C718	2301-000247	C-FILM,PEF;33nF,5%,50V,TP,8.1x4.5x13mm,5m	
C719	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C720	2401-002235	C-AL;10uF,20%,16V,GP,TP,5x11mm,5mm	
C721	2301-000175	C-FILM,PEF;15nF,5%,50V,TP,7.1x3.5x13mm,5m	
C722	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C723	2301-000175	C-FILM,PEF;15nF,5%,50V,TP,7.1x3.5x13mm,5m	
C725	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C727	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C730	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C731	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C732	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C733	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C734	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C735	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C736	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C737	2202-000231	C-CERAMIC,MLC-AXIAL;330pF,10%,50V,Y5P,TP,3.5x19,-	
C801	2306-000321	C-FILM,MPPF;470NF,5%,275V,TP,-,22.5	
C802	2306-000321	C-FILM,MPPF;470NF,5%,275V,TP,-,22.5	
C804	2201-000332	C-CERAMIC,DISC;2.2nF,20%,250VAC,Y5U,TP,11x7,7	
C805	2201-000332	C-CERAMIC,DISC;2.2nF,20%,250VAC,Y5U,TP,11x7,7	

Loc. No.	Code No.	Description ; Specification	Remark
C806	2401-001426	C-AL;470uF,20%,400V,GP,-,35x45mm,10	
C807	2303-000163	C-FILM,PPF;2.2nF,5%,800V,TP,15x13x8.5,7.5	
C808	2401-002292	C-AL;47uF,20%,25V,WT,TP,8X11,5	
C809	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C811	2301-000310	C-FILM,PEF;68nF,5%,50V,TP,8.0X8.5X4.0X5,5	
C812	2201-002002	C-CERAMIC,DISC;4700pF,20%,400V,+20%~-55%,TP,2	
C813	2201-002002	C-CERAMIC,DISC;4700pF,20%,400V,+20%~-55%,TP,2	
C814	2201-000683	C-CERAMIC,DISC;850pF,10%,1KV,Y5P,TP,10x5,5	
C815	2401-003026	C-AL;330uF,20%,200V,GP,ST,22x35,10	
C816	2401-000293	C-AL;100uF,+30-10%,200V,GP,TP,16x25	
C817	2201-000599	C-CERAMIC,DISC;560pF,10%,500V,Y5P,TP,7x4,5	
C818	2401-000722	C-AL;2200uF,20%,25V,WT,TP,16x25,7.5	
C819	2201-000599	C-CERAMIC,DISC;560pF,10%,500V,Y5P,TP,7x4,5	
C820	2401-000722	C-AL;2200uF,20%,25V,WT,TP,16x25,7.5	
C821	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C822	2201-000599	C-CERAMIC,DISC;560pF,10%,500V,Y5P,TP,7x4,5	
C823	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C824	2305-000289	C-FILM,MPEF;220nF,5%,63V,TP,-,5mm	
C825	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C826	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C827	2401-002235	C-AL;10uF,20%,16V,GP,TP,5x11mm,5mm	
C828	2401-000493	C-AL;10uF,20%,50V,LZ,TP,5x11mm,5mm	
C829	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C830	2401-000611	C-AL;1uF,20%,50V,WT,TP,5x11,5	
C831	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C832	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
C833	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
C835	2401-002286	C-AL;470uF,20%,16V,WT,TP,10x12.5,5	
C901	2201-000234	C-CERAMIC,DISC;150pF,5%,50V,CH,TP,9.5x3,5	
C902	2301-000108	C-FILM,PEF;1.5nF,5%,50V,TP,6.5x3.0x5.5mm,	
C903	2201-000119	C-CERAMIC,DISC;100nF,+80-20%,50V,Y5V,TP,8x3.5	
C904	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C905	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C906	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C907	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C908	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C909	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C910	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C911	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C912	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C913	2301-000445	C-FILM,PEF;4.7nF,5%,50V,TP,5.5x7x3mm,5mm	
C914	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C915	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
C916	2201-000257	C-CERAMIC,DISC;16pF,5%,50V,CH,TP,5x3,5	
C917	2201-000483	C-CERAMIC,DISC;33pF,5%,50V,CH,TP,5x3,5	
C918	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C919	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C920	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C921	2202-000796	C-CERAMIC,MLC-AXIAL;1NF,10%,50V,Y5P,TP,3.5X1.9MM,-	
C922	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
C923	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C924	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C925	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C926	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C927	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
C928	2401-001333	C-AL;470nF,20%,50V,GP,TP,5x11,5	
CE01	2401-002597	C-AL;220uF,20%,35V,GP,TP,10x12.5,5	
CE02	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
CE03	2305-000470	C-FILM,MPEF;68nF,5%,100V,TP,-,5mm	
CN501B	AA39-20604A	LEAD CONNECTOR-ASSY;-,YBNH250-9,YBNH05/04,5/4P,50	
CN602	3711-002644	CONNECTOR-HEADER;BOX,5P,1R,2.5mm,STRAIGHT,SN	
CN701	3711-002647	CONNECTOR-HEADER;BOX,8P,1R,2.5mm,STRAIGHT,SN	
CN802	AA27-20004K	COIL-DEGAUSSING;-,29,19.0ohm,45T,3000mm,E	
CW901	2503-000156	C-NETWORK;100pFx4,20%,50V	
D101	0401-001024	DIODE-SWITCHING;BAW75,25V,300mA,DO-35,TP	
D201	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D202	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D203	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D204	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D205	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D209	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204	
D210	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D217	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D301	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D302	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D303	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D304	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	

Loc. No.	Code No.	Description ; Specification	Remark
D401	0402-000493	DIODE-RECTIFIER;1R5GU41,400V,1.5A,DO-15L,TP	
D402	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D403	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D404	0402-001012	DIODE-RECTIFIER;FMP-3FU,1500V,5A,TO-3PF	
D406	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D407	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204	
D410	0402-000493	DIODE-RECTIFIER;1R5GU41,400V,1.5A,DO-15L,TP	
D507	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D508	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D509	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D520	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D601	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
D602	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D701	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D801	0402-000213	DIODE-RECTIFIER;ERB12-06,600V,1.0A,DO-41,TP	
D802	0402-001160	DIODE-BRIDGE;D5SB60,600V,2.8A,SIP-4,ST	
D803	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
D804	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D805	0402-000231	DIODE-RECTIFIER;FMG-G26S,600V,4A,TO-220F,ST	
D806	0402-000493	DIODE-RECTIFIER;1R5GU41,400V,1.5A,DO-15L,TP	
D807	0402-000233	DIODE-RECTIFIER;FML-G12S,200V,5A,-,-	
D808	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D809	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D810	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D813	0402-000493	DIODE-RECTIFIER;1R5GU41,400V,1.5A,DO-15L,TP	
D901	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D902	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D903	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D904	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D905	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D906	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D907	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
DE01	0402-000546	DIODE-RECTIFIER;TVR10G,400V,1.0A,DO-41,TP	
DV801	1405-000187	VARISTOR;750V,1250A,12.5x7mm,TP	
DV802	1405-000187	VARISTOR;750V,1250A,12.5x7mm,TP	
DZ201	0403-000297	DIODE-ZENER;MTZ6.2B,6.2V,5.96-6.27V,500mW,	
DZ202	0403-000297	DIODE-ZENER;MTZ6.2B,6.2V,5.96-6.27V,500mW,	
DZ203	0403-000298	DIODE-ZENER;MTZ6.8C,6.8V,6.66-7.01V,500mW,	
DZ204	0403-000662	DIODE-ZENER;MTZ3.0B,3.0V,3.01-3.22V,500mW,	
DZ205	0403-000551	DIODE-ZENER;MTZ3.9B,3.9V,3.89-4.16V,500mW,	
DZ206	0403-000294	DIODE-ZENER;MTZ4.7B,4.7V,4.55-4.80V,500mW,	
DZ210	0403-000659	DIODE-ZENER;MTZ2.0A,2V,1.88-2.10V,500mW,DO	
DZ302	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ303	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ304	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ305	0403-000494	DIODE-ZENER;MTZ39,39V,35.36-37.2V,500mW,DO	
DZ306	0403-000700	DIODE-ZENER;TZP33A,33V,31-35V,1W,DO-41,TP	
DZ402	0403-000300	DIODE-ZENER;MTZ8.2B,8.2V,7.78-8.19V,500mW,	
DZ403	0403-000698	DIODE-ZENER;TZP12A,12V,11.4-12.6V,1W,DO-41	
DZ505	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ601	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ602	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ603	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ604	0403-000545	DIODE-ZENER;MTZ24B,24V,22.61-23.77V,500mW,	
DZ701	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ702	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ703	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ704	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ705	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ801	0403-000300	DIODE-ZENER;MTZ8.2B,8.2V,7.78-8.19V,500mW,	
DZ802	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ803	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ805	1203-001217	IC-POSI.ADJUST REG.;431,TO-92,3P,4.58MIL,PLASTIC,2	
DZ807	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ808	0403-000562	DIODE-ZENER;MTZ7.5B,7.5V,7.07-7.45V,500mW,	
DZ901	1203-000451	IC-VOLTAGE REGULATOR;33,TO-92,3P,-,PLASTIC,31/35V,2	
DZ904	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ905	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ906	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
⚠ F801	3601-000281	FUSE-FERRULE;250V,4A,TL,GLASS,5.2x20mm	
F801A	3602-000114	FUSE-HOLDER;-,-,30mohm	
F801B	3602-000114	FUSE-HOLDER;-,-,30mohm	
⚠ F802	3601-001086	FUSE-FERRULE;125V,5A,FA,GLASS,2.4x7.5mm	
⚠ F803	3601-001086	FUSE-FERRULE;125V,5A,FA,GLASS,2.4x7.5mm	
GT804A	AA39-20010B	LEAD-CONNECTOR,ASSY;-,YFH800-01,S,1P,500,1617#22	
⚠ HC101	AA13-20004W	IC-HYBRID;-,PAP103T,SIP,6P,PRE-AMP,TP	
⚠ IC201	0904-001294	IC-BUS CONTROLLER;	

Loc. No.	Code No.	Description ; Specification	Remark
⚠ IC301	1204-000517	IC-VERTIVAL DEF.;LA7845,SIP,7P,-,PLASTIC,40V,11	
⚠ IC501	1201-001330	IC-VIDEO AMP;6108,ZSIP,9P,-,SINGLE,-,PLASTI	
⚠ IC601	1201-001064	IC-POWER AMP;7297,ZIP,15P,-,DUAL,32dB,PLAST	
⚠ IC701	1204-000473	IC-AUDIO PROCESSOR;TDA9859,DIP,32P,-,PLASTIC,-,-,	
⚠ IC801	1203-001482	IC-PWM CONTROLLER;3S1265R,TO-3P,5P,210,PLASTIC,6	
⚠ IC802	0604-001038	PHOTO-COUPLER;TR,130-260%,200mW,DIP-4,ST	
⚠ IC803	1203-001006	IC-VOLTAGE REGULATOR;78R05,TO-220F,4P,-,PLASTIC,4.8	
⚠ IC804	1203-000644	IC-POSI.FIXED REG.;7630,SIP,10P,-,PLASTIC,5.1/8V,	
⚠ IC901	AA13-30021S	IC-MCU;-,Z9036512PSC-R4013,16BIT,SDIP	
⚠ IC902	1103-001105	IC-EEPROM;24C040,4Kx1BIT,DIP,8P,300MIL,1	
⚠ ICE01	1201-000191	IC-OP AMP;4558,DIP,8P,300MIL,DUAL,20V/mV	
JA701	3722-001333	JACK-RCA;9P,3.2mm,NI,BLK,-	
L101	2701-000326	INDUCTOR-AXIAL;560nH,10%,2.3x3.4mm	
L102	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L103	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L201	2701-000142	INDUCTOR-AXIAL;1uH,10%,2.5x3.4mm	
L202	2701-000197	INDUCTOR-AXIAL;5.6uH,10%,2.5x3.4mm	
L203	2701-000197	INDUCTOR-AXIAL;5.6uH,10%,2.5x3.4mm	
L205	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L206	2701-000142	INDUCTOR-AXIAL;1uH,10%,2.5x3.4mm	
L207	2701-000142	INDUCTOR-AXIAL;1uH,10%,2.5x3.4mm	
L208	2701-000142	INDUCTOR-AXIAL;1uH,10%,2.5x3.4mm	
L303	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L401	AA27-40003H	COIL-HORIZ,WIDTH;-,2mH,DR15x20,2UEW0.35,ST	
L402	AA27-30003G	COIL-LINERITY;-,44uH,DR14x15,PI0.2x10,18x33,	
L403	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L404	AA27-40003L	COIL-HORIZ,WIDTH;-,1.0mH,DR14x20,2UEW0.45,ST	
L601	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L603	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L701	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L702	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L703	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L704	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L705	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L706	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L707	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L708	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L709	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L801	AA29-30002F	FILTER-LINE NOISE;-,6mH,2.45A,-,-	
L802	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L803	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L804	2901-000299	FILTER-EMI ON BOARD;-,6A,UL/CSA,-,9x7.5,TP,-	
L805	2701-001032	INDUCTOR-AXIAL;100uH,10%,5x14mm	
L806	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
L807	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L808	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L901	2701-000189	INDUCTOR-AXIAL;470nH,10%,2.5x3.4mm	
L902	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L903	2701-000197	INDUCTOR-AXIAL;5.6uH,10%,2.5x3.4mm	
L904	2701-000211	INDUCTOR-AXIAL;68uH,10%,2.5x3.4mm	
L905	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L906	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
LD901	AA96-30001B	ASSY-LED,GUIDE;-,AA61-50055A,DL-G5RGA,-	
Q101	0501-000245	TR-SMALL SIGNAL;BC548C,NPN,500mW,TO-92,TP,420-	
Q201	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q202	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q204	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q205	0504-000150	TR-DIGITAL;KSR2010,PNP,300mW,10K,TO-92,TP	
Q206	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q207	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q210	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q301	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q302	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
⚠ Q401	0502-000298	TR-POWER;KSD73,NPN,30W,TO-220,-,120-240	
⚠ Q402	0502-001007	TR-POWER;KSC2073-H2,NPN,25W,TO-220,ST,6	
⚠ Q403	0502-001136	TR-POWER;KSD5703,NPN,70W,TO-3PF,ST,8-	
Q701	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q702	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q704	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
Q801	0501-000369	TR-SMALL SIGNAL;KSC2331-Y,NPN,1W,TO-92L,-,120-	
Q901	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q902	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q903	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q904	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q905	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q906	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
Q907	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q908	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q909	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QE01	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
R102	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R103	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R104	2001-000674	R-CARBON;360OHM,5%,1/8W,AA,TP,-	
R105	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R201	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R202	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,-	
R203	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R204	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R212	2001-000005	R-CARBON;390OHM,5%,1/8W,AA,TP,-	
R214	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
R215	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R217	2001-000343	R-CARBON;130OHM,5%,1/8W,AA,TP,-	
R218	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R219	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R220	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R221	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R222	2701-000142	INDUCTOR-AXIAL;1uH,10%,2.5x3.4mm	
R223	2001-000617	R-CARBON;3.9MOHM,5%,1/8W,AA,TP,-	
R224	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R225	2001-001026	R-CARBON;910OHM,5%,1/8W,AA,TP,-	
R226	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
R230	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,-	
R231	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R232	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-	
R233	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R234	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R235	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R237	2001-000007	R-CARBON;3KOHM,5%,1/8W,AA,TP,-	
R238	2001-001110	R-CARBON(S);240KOHM,5%,1/2W,AA,TP,-	
R239	2001-000008	R-CARBON;15KOHM,5%,1/8W,AA,TP,-	
R240	2001-001125	R-CARBON(S);300KOHM,5%,1/2W,AA,TP,-	
R241	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R243	2001-000232	R-CARBON;1.3KOHM,5%,1/8W,AA,TP,-	
R246	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-	
R247	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R248	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
R249	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R250	2001-000938	R-CARBON;68OHM,5%,1/8W,AA,TP,-	
R251	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R252	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-	
R253	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,-	
R255	2001-000008	R-CARBON;15KOHM,5%,1/8W,AA,TP,-	
R256	2004-001234	R-METAL;75Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R257	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-	
R258	2004-001914	R-METAL;39Kohm,2%,1/8W,AA,TP,1.8x3.5mm	
R259	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R260	2001-001015	R-CARBON;9.1KOHM,5%,1/8W,AA,TP,-	
R261	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,-	
R262	2001-001015	R-CARBON;9.1KOHM,5%,1/8W,AA,TP,-	
R301	2001-001045	R-CARBON(S);1.2KOHM,5%,1/2W,AA,TP,-	
R302	2001-001049	R-CARBON(S);1.3KOHM,5%,1/2W,AA,TP,-	
R303	2001-000016	R-CARBON(S);1OHM,5%,1/2W,AA,TP,-	
R304	2008-000254	R-FUSIBLE(S);0.68ohm,5%,2W,AF,TP,3.9x10mm	
R305	2003-002009	R-METAL OXIDE(S);390ohm,5%,2W,AF,TP,3.9x10mm	
R306	2003-002009	R-METAL OXIDE(S);390ohm,5%,2W,AF,TP,3.9x10mm	
R308	2003-002009	R-METAL OXIDE(S);390ohm,5%,2W,AF,TP,3.9x10mm	
R309	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R310	2001-000387	R-CARBON;16KOHM,5%,1/8W,AA,TP,-	
R311	2001-000660	R-CARBON;33KOHM,5%,1/8W,AA,TP,-	
R312	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,-	
R313	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R314	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R315	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R316	2001-000660	R-CARBON;33KOHM,5%,1/8W,AA,TP,-	
R317	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R404	2008-001013	R-FUSIBLE(S);1.2ohm,5%,2W,AF,TP,3.9x10mm	
R405	2001-001138	R-CARBON(S);390OHM,5%,1/2W,AA,TP,-	
R406	2003-002008	R-METAL OXIDE(S);18Kohm,5%,2W,AF,TP,3.9x10mm	
R407	2003-001025	R-METAL OXIDE(S);15Kohm,5%,2W,AF,TP,3.9x10mm	
R409	2008-000264	R-FUSIBLE(S);1ohm,5%,1W,AF,TP,3.9x10mm	
R410	2001-001114	R-CARBON(S);2700HM,5%,1/2W,AA,TP,-	
R411	2001-000022	R-CARBON(S);33OHM,5%,1/2W,AA,TP,-	
R412	2001-000020	R-CARBON(S);22OHM,5%,1/2W,AA,TP,-	
R413	2008-000251	R-FUSIBLE(S);0.27ohm,10%,2W,AF,TP,3.9x10mm	

Loc. No.	Code No.	Description ; Specification	Remark
R414	2008-000278	R-FUSIBLE(S);82ohm,5%,2W,AA,TP,3.9x10mm	
R415	2008-000254	R-FUSIBLE(S);0.68ohm,5%,2W,AF,TP,3.9x10mm	
R417	2001-001164	R-CARBON(S);56KOHM,5%,1/2W,AA,TP,-	
R418	2004-001967	R-METAL(S);68Kohm,1%,1/2W,AA,TP,2.5x6.5mm	
R419	2004-001390	R-METAL(S);1Kohm,2%,1/2W,AA,TP,2.4x6.4mm	
R420	2001-001114	R-CARBON(S);270OHM,5%,1/2W,AA,TP,-	
R421	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R422	2008-001013	R-FUSIBLE(S);1.2ohm,5%,2W,AF,TP,3.9x10mm	
R424	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R425	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R428	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R429	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R430	2001-001043	R-CARBON(S);0OHM,5%,1/2W,AA,TP,-	
R501	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R502	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R503	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R505	2008-000254	R-FUSIBLE(S);0.68ohm,5%,2W,AF,TP,3.9x10mm	
R506	2008-000299	R-FUSIBLE(S);47ohm,5%,2W,AF,TP,3.9x10mm	
R507	2001-000490	R-CARBON;200OHM,5%,1/8W,AA,TP,-	
R508	2001-000490	R-CARBON;200OHM,5%,1/8W,AA,TP,-	
R509	2001-000490	R-CARBON;200OHM,5%,1/8W,AA,TP,-	
R510	2002-001009	R-COMPOSITION;2.7Kohm,10%,1/2W,AA,TP,3.7X9.0	
R517	2002-001009	R-COMPOSITION;2.7Kohm,10%,1/2W,AA,TP,3.7X9.0	
R518	2002-001009	R-COMPOSITION;2.7Kohm,10%,1/2W,AA,TP,3.7X9.0	
R519	2002-001009	R-COMPOSITION;2.7Kohm,10%,1/2W,AA,TP,3.7X9.0	
R520	2001-001062	R-CARBON(S);10MOHM,5%,1/2W,AA,TP,-	
R601	2008-001002	R-FUSIBLE(S);0.18ohm,5%,2W,AA,TP,3.9x10mm	
R602	2008-001002	R-FUSIBLE(S);0.18ohm,5%,2W,AA,TP,3.9x10mm	
R603	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-	
R604	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,-	
R605	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R606	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-	
R607	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,-	
R701	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R702	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R703	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R704	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R705	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R706	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R707	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R708	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,-	
R709	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R710	2001-000628	R-CARBON;300OHM,5%,1/8W,AA,TP,-	
R711	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R712	2001-000539	R-CARBON;24KOHM,5%,1/8W,AA,TP,-	
R713	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R714	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R715	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R716	2001-000660	R-CARBON;33KOHM,5%,1/8W,AA,TP,-	
R717	2001-000539	R-CARBON;24KOHM,5%,1/8W,AA,TP,-	
R718	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R719	2001-000527	R-CARBON;22OHM,5%,1/8W,AA,TP,-	
R720	2001-000387	R-CARBON;16KOHM,5%,1/8W,AA,TP,-	
R721	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,-	
R722	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R723	2001-000387	R-CARBON;16KOHM,5%,1/8W,AA,TP,-	
R724	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,-	
R725	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R728	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R729	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R732	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R733	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R734	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R735	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
R736	2001-000660	R-CARBON;33KOHM,5%,1/8W,AA,TP,-	
R740	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R741	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R801	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
R802	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm	
R803	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm	
R804	2001-001150	R-CARBON(S);470KOHM,5%,1/2W,AA,TP,-	
R805	2001-001150	R-CARBON(S);470KOHM,5%,1/2W,AA,TP,-	
R806	2003-001023	R-METAL OXIDE(S);120ohm,0.05,2W,AF,TP,3.9x10mm	
R807	2001-001178	R-CARBON(S);680OHM,5%,1/2W,AA,TP,-	
R808	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
R809	2002-001013	R-COMPOSITION;4.7Mohm,10%,1/2W,AA,TP,3.7x9mm	
R810	2003-000782	R-METAL OXIDE(S);7.5Kohm,5%,2W,AA,TP,4x12mm	
R811	2003-000462	R-METAL OXIDE(S);10Kohm,5%,2W,AA,TP,4x12mm	
R813	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R814	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R815	2004-001889	R-METAL(S);127Kohm,1%,1/2W,AA,TP,2.5x6.5m	
R816	2004-001983	R-METAL(S);2.49Kohm,1%,1/2W,AA,TP,2.4x6.4	
R817	2001-001153	R-CARBON(S);47OHM,5%,1/2W,AA,TP,-	
R818	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R819	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-	
R820	2008-001047	R-FUSIBLE(S);68ohm,5%,2W,AF,TP,3.9x10mm	
R821	2008-000271	R-FUSIBLE(S);3.3ohm,5%,2W,AA,TP,3.9x10mm	
R822	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R823	2008-000264	R-FUSIBLE(S);1ohm,5%,1W,AF,TP,3.9x10mm	
R824	2001-001125	R-CARBON(S);300KOHM,5%,1/2W,AA,TP,-	
R826	2001-001153	R-CARBON(S);47OHM,5%,1/2W,AA,TP,-	
R901	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R902	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R903	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,-	
R904	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R905	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R906	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R907	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R908	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-	
R909	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-	
R910	2001-000924	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
R911	2001-000214	R-CARBON;1.1KOHM,5%,1/8W,AA,TP,-	
R912	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R913	2001-000241	R-CARBON;1.5KOHM,5%,1/8W,AA,TP,-	
R914	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,-	
R918	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R919	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R920	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-	
R921	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R922	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R923	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
R924	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R925	2001-000924	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
R926	2001-000924	R-CARBON;680OHM,5%,1/8W,AA,TP,-	
R927	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R928	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R929	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R930	2001-000628	R-CARBON;300OHM,5%,1/8W,AA,TP,-	
R931	2001-001114	R-CARBON(S);270OHM,5%,1/2W,AA,TP,-	
R932	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R933	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R934	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R935	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
R936	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R937	2001-001062	R-CARBON(S);10MOHM,5%,1/2W,AA,TP,-	
R938	2001-000832	R-CARBON;510OHM,5%,1/8W,AA,TP,-	
R939	2001-000397	R-CARBON;180KOHM,5%,1/8W,AA,TP,-	
R940	2001-001062	R-CARBON(S);10MOHM,5%,1/2W,AA,TP,-	
R941	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R942	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
R943	2001-000793	R-CARBON;47OHM,5%,1/8W,AA,TP,-	
R945	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
R948	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R951	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,-	
R953	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R954	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
R955	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RE01	2004-001390	R-METAL(S);1Kohm,2%,1/2W,AA,TP,2.4x6.4mm	
RE02	2004-001914	R-METAL;39Kohm,2%,1/8W,AA,TP,1.8x3.5mm	
RE03	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,-	
RE04	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,-	
RE05	2001-000052	R-CARBON(S);3.3KOHM,5%,1/2W,AA,TP,-	
RE06	2004-001390	R-METAL(S);1Kohm,2%,1/2W,AA,TP,2.4x6.4mm	
RE07	2003-000652	R-METAL OXIDE(S);330ohm,5%,2W,AF,TP,4x12mm	
RE08	2001-001120	R-CARBON(S);3.3OHM,5%,1/2W,AA,TP,-	
RE09	2001-001125	R-CARBON(S);300KOHM,5%,1/2W,AA,TP,-	
RE10	2001-001125	R-CARBON(S);300KOHM,5%,1/2W,AA,TP,-	
RL801	3501-001040	RELAY-POWER;12VDC,500mW,10A,1FormA,15mS,5m	
RM901	AA59-60001U	MODULE-REMOCON;-,ORC-50VF/SR-12V,38KHz,940nm,	
RP802	1404-001045	THERMISTOR-NTC;4.7ohm,15%,2900K,35.0mW,TP	
RP803	1404-001087	THERMISTOR-PTC;7ohm,30%,220V,270V,19A,-,ST	
SF101	2904-001143	FILTER-SAW AV;38.9MHz,SIP5K,TP,16.5dB,B/G,L/	
SW801	3403-001020	SWITCH-PUSH;250V,5A,DPST,OFF-ON-OFF	
SW901	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	

Loc. No.	Code No.	Description ; Specification	Remark
SW902	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW903	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW904	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW905	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
⚠ T401	AA26-50001R	TRANS-HORIZ DRIVE;-,80MH,580UH,4UH,G11A EI19,ST	
⚠ T444	AA26-30005Q	TRANS-FLYBACK;-,FUH-29A001(S),29/25,130V	
⚠ T801	AA26-20007W	TRANS-SWITCHING;-,90~260V,130/15.5/12/8V,VDE,S	
⚠ TU101	AA40-10006H	TUNER-V/S;TELE4-108A,PAL-B/G,TR,181CH	
⚠ V999	3704-001105	SOCKET-CRT;11P,20PI,26.5PI,NI,-	
X202	2801-000274	CRYSTAL-UNIT;4.433619MHz,30ppm,28-AAM,20pF,	
X203	2801-000226	CRYSTAL-UNIT;3.579545MHz,20ppm,28-AAM,15pF,	
X901	2801-003224	CRYSTAL-UNIT;32.768KHz,20ppm,28-AAY,12.5pF,	
Z207	2903-000129	FILTER-CERAMIC;TR,4.5M/4.72MHZ,-,-,-,TP,-	
Z208	2903-000181	FILTER-CERAMIC;TR,5.5MHz,-,-,-,TP,TPS5.5MB-TF	

ASSY-SOUND

*	AA95-40011V	ASSY-SOUND;-,-,S51A,NICAM,-,-	
CN01	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012,-	
CN02	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012,-	
CN03	2203-000891	C-CERAMIC,CHIP;4.7nF,10%,50V,X7R,TP,2012,-	
CN04	2203-002392	C-CERAMIC,CHIP;220nF,+80-20%,50V,Y5V,TP,2012,	
CN05	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN06	2401-000914	C-AL;22uF,20%,16V,GP,TP,5x11,5	
CN07	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN08	2203-001002	C-CERAMIC,CHIP;47pF,5%,50V,NPO,TP,2012,-	
CN09	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012,-	
CN10	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012,-	
CN11	2203-000192	C-CERAMIC,CHIP;100nF,+80-20%,50V,Y5V,TP,2012,	
CN12	2203-000495	C-CERAMIC,CHIP;2.2nF,10%,50V,X7R,TP,2012,-	
CN13	2203-000495	C-CERAMIC,CHIP;2.2nF,10%,50V,X7R,TP,2012,-	
CN14	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN15	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN16	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN17	2401-000620	C-AL;2.2uF,10%,50V,GP,TP,5x11,5	
CN18	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN19	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN20	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN21	2203-000802	C-CERAMIC,CHIP;33nF,10%,50V,X7R,TP,2012,-	
CN22	2203-002442	C-CERAMIC,CHIP;330nF,+80-20%,25V,Y5V,TP,2012,	
CN23	2203-000389	C-CERAMIC,CHIP;15pF,5%,50V,NPO,TP,2012,-	
CN24	2203-000818	C-CERAMIC,CHIP;33pF,5%,50V,NPO,TP,2012,-	
CN25	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN26	2203-000192	C-CERAMIC,CHIP;100nF,+80-20%,50V,Y5V,TP,2012,	
CN27	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11,5	
CN28	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN29	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN30	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
CN31	2203-000925	C-CERAMIC,CHIP;470nF,+80-20%,50V,Y5V,TP,2012,	
CN32	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	
CN33	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
CNN01	3711-002704	CONNECTOR-HEADER;NOWALL,6P,1R,2.5mm,ANGLE,SN	
CNN02	3711-002705	CONNECTOR-HEADER;NOWALL,7P,1R,2.5mm,ANGLE,SN	
DN01	0401-000160	DIODE-SWITCHING;ISS314,30V,100mA,USC,TP	
DN02	0401-000160	DIODE-SWITCHING;ISS314,30V,100mA,USC,TP	
DN03	0405-000108	DIODE-VARACTOR;BB405B,28V,10nA,DO-34,TP	
ICN01	1204-001047	IC-FM CIRCUIT;TDA9808,DIP,20P,-,PLASTIC,5.5V	
ICN02	1209-001113	IC-ETC, LINEAR;TDA9874H,QFP,44P,-,PLASTIC,6.5	
JN01	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
LN01	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
LN02	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
LN03	2701-000168	INDUCTOR-AXIAL;3.3uH,5%,2.5x3.4mm	
LN04	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
LN05	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
LN06	2701-000202	INDUCTOR-AXIAL;560nH,10%,2.5x3.4mm	
QN01	0501-000344	TR-SMALL SIGNAL;KSC1623-G,NPN,200mW,SOT-23,TP,	
QN02	0501-000344	TR-SMALL SIGNAL;KSC1623-G,NPN,200mW,SOT-23,TP,	
QN03	0501-000344	TR-SMALL SIGNAL;KSC1623-G,NPN,200mW,SOT-23,TP,	
RN01	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	
RN02	2007-001071	R-CHIP;6.8KOHM,5%,1/10W,DA,TP,2012	
RN03	2007-000282	R-CHIP;100KOHM,5%,1/10W,DA,TP,2012	
RN04	2007-001071	R-CHIP;6.8KOHM,5%,1/10W,DA,TP,2012	
RN05	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	
RN06	2007-001071	R-CHIP;6.8KOHM,5%,1/10W,DA,TP,2012	
RN07	2007-000981	R-CHIP;5.6KOHM,5%,1/10W,DA,TP,2012	
RN08	2007-000030	R-CHIP;560OHM,5%,1/10W,DA,TP,2012	
RN09	2007-000030	R-CHIP;560OHM,5%,1/10W,DA,TP,2012	
RN10	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	
RN11	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	
RN12	2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,2012	
RN13	2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,2012	
RN14	2007-000881	R-CHIP;4.7ohm,5%,1/10W,DA,TP,2012	
RN15	2007-000830	R-CHIP;39KOHM,5%,1/10W,DA,TP,2012	
RN16	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
RN17	2007-000830	R-CHIP;39KOHM,5%,1/10W,DA,TP,2012	
RN18	2007-001177	R-CHIP;8.2KOHM,5%,1/10W,DA,TP,2012	
RN19	2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,2012	
RN20	2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,2012	
RN21	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
RN22	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
RN23	2007-000881	R-CHIP;4.7ohm,5%,1/10W,DA,TP,2012	
RN26	2007-000308	R-CHIP;10OHM,5%,1/10W,DA,TP,2012	
SFN01	2904-001010	FILTER-SAW AV;32.9~33.4MHz,SIP5P,ST,14.4dB,P	
SFN02	2904-001054	FILTER-SAW AV;38.9MHz,SIP5P,-,13.9dB,NTSC-M/	
TN01	AA26-10004E	TRANS-IF;-,7MG,VIF,-,7mm,8pF,116.7MHz,S	
XN01	2801-003316	CRYSTAL-UNIT;24.576MHz,30ppm,28-AAM,20pF,30	

ASSY-PCB,TTX

*	AA95-90035J	ASSY-PCB,TTX;-,-,S51A,PAL,-,-	
CNP01	3711-002704	CONNECTOR-HEADER;NOWALL,6P,1R,2.5mm,ANGLE,SN	
CNT01	3711-002702	CONNECTOR-HEADER;NOWALL,4P,1R,2.5mm,ANGLE,SN	
CNT02	3711-002703	CONNECTOR-HEADER;NOWALL,5P,1R,2.5mm,ANGLE,SN	
CNT03	3711-002705	CONNECTOR-HEADER;NOWALL,7P,1R,2.5mm,ANGLE,SN	
CT01	2401-000242	C-AL;100uF,20%,10V,GP,TP,5x11,5	
CT02	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
CT04	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
CT05	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
CT07	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
CT08	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
CT09	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
CT10	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
CT11	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
CT12	2401-001333	C-AL;470nF,20%,50V,GP,TP,5x11,5	
CT13	2401-000404	C-AL;10uF,20%,16V,BP,TP,5x11,5	
CT14	2401-000404	C-AL;10uF,20%,16V,BP,TP,5x11,5	
CT15	2401-000404	C-AL;10uF,20%,16V,BP,TP,5x11,5	
CT16	2401-000242	C-AL;100uF,20%,10V,GP,TP,5x11,5	
CT17	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V,TP,2.2x3.	
DT01	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
DZT01	0403-000355	DIODE-ZENER;UZ5.1BSB,5.1V,4.97-5.18V,500mW	
ICT01	1204-001356	IC-PAL DECODER;SAA5261/108,DIP,52P,-,PLASTIC,	
ICT02	1103-001107	IC-EEPROM;24C020,2Kx1BIT,DIP,8P,300MIL,1	
ICT03	1203-000641	IC-RESET;7442,TO-92,3P,-,PLASTIC,-0.3/7	
LT01	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
QT01	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QT02	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QT03	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QT04	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QT05	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
QT06	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
QT07	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
RT01	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
RT02	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
RT03	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
RT04	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
RT05	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,-	
RT06	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
RT07	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,-	
RT08	2001-000563	R-CARBON;27KOHM,5%,1/8W,AA,TP,-	
RT11	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT12	2001-000800	R-CARBON;5.1KOHM,5%,1/8W,AA,TP,-	
RT13	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT14	2001-000007	R-CARBON;3KOHM,5%,1/8W,AA,TP,-	
RT15	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,-	
RT17	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
RT18	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,-	
RT20	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT21	2001-000628	R-CARBON;300OHM,5%,1/8W,AA,TP,-	
RT22	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	

Loc. No.	Code No.	Description ; Specification	Remark
RT23	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
RT24	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,-	
RT25	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT26	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
RT27	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,-	
RT28	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT29	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,-	
RT30	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,-	
RT31	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT32	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
RT33	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
RT34	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT35	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
RT36	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
RT37	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT38	2001-000969	R-CARBON;75OHM,5%,1/8W,AA,TP,-	
RT39	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,-	
RT40	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,-	
RT42	2001-000568	R-CARBON;27OHM,5%,1/8W,AA,TP,-	
XT01	2801-003433	CRYSTAL-UNIT;12MHz,30ppm,28-AAA,30pF,30ohm,	

ASSY-PCB,A/V SIDE

*	AA95-90035K	ASSY-PCB,A/V SIDE;-,CS254D,S51A,PAL,W/O WOOFER,-	
CA06	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
CA07	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	
CN01A	AA39-20068E	LEAD-CONNECTOR,ASSY;-,YBNH025-08,67096-008,8P,500,	
CN05A	AA39-20069C	LEAD-CONNECTOR,ASSY;-,YBNH025-05,67096-005,5P,400,	
CN06A	AA39-20499B	LEAD CONNECTOR-ASSY;-,YBNH025-04,SMP025-4,4P,200,	
JA01	3722-001031	JACK-RCA;3P,3.6mm,#18,AU	
JE01	3722-000143	JACK-PHONE;1P(VER),3.4mm,AG,BLK,NO	
RA01	2001-000028	R-CARBON(S);100OHM,5%,1/2W,AA,TP,-	
RA02	2001-000028	R-CARBON(S);100OHM,5%,1/2W,AA,TP,-	

ASSY-POWER,CORD

⚠	AA39-10006X	POWER-CORD;-,KKP419C,KLCE-2F,2.286MT,3P,V	
	AA61-20050A	HOLDER-CORD;-,-,PP,V0,BLK,DO	

REMOCON

*	AA59-10116A	REMOCON;-,TM59,SS,SZM503AT,29,-,-,L/GR	

ASSY-SPEAKER

	3001-001072	SPEAKER;5W,16ohm,90dB,180Hz	
	AA39-20583B	LEAD CONNECTOR-ASSY;-,YSH025-04,REC,REC,4P,400,800	

ASSY-CRT

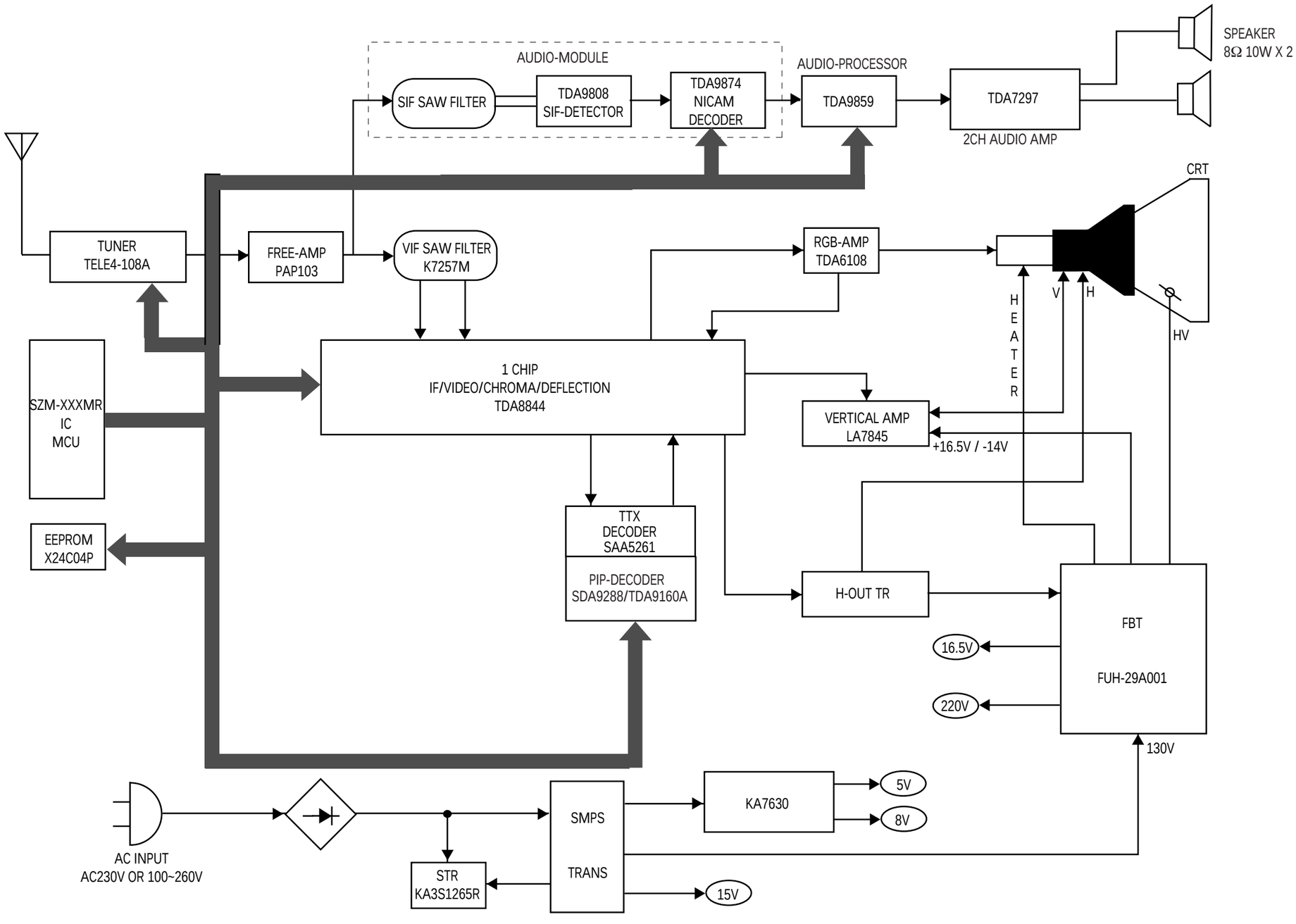
⚠	AA03-10031U	CRT-COLOR;-,A68KVL74X01(M),-200mG,29,11	

ASSY-ACCESSORY

	AA39-40001B	CABLE-RCA;-,RCA,1500mm,0.12/10,RED/WHT/Y	
	AA68-11363A	MANUAL-USERS;S51A,ENG,TM59,B5,W/P 100(G),-	

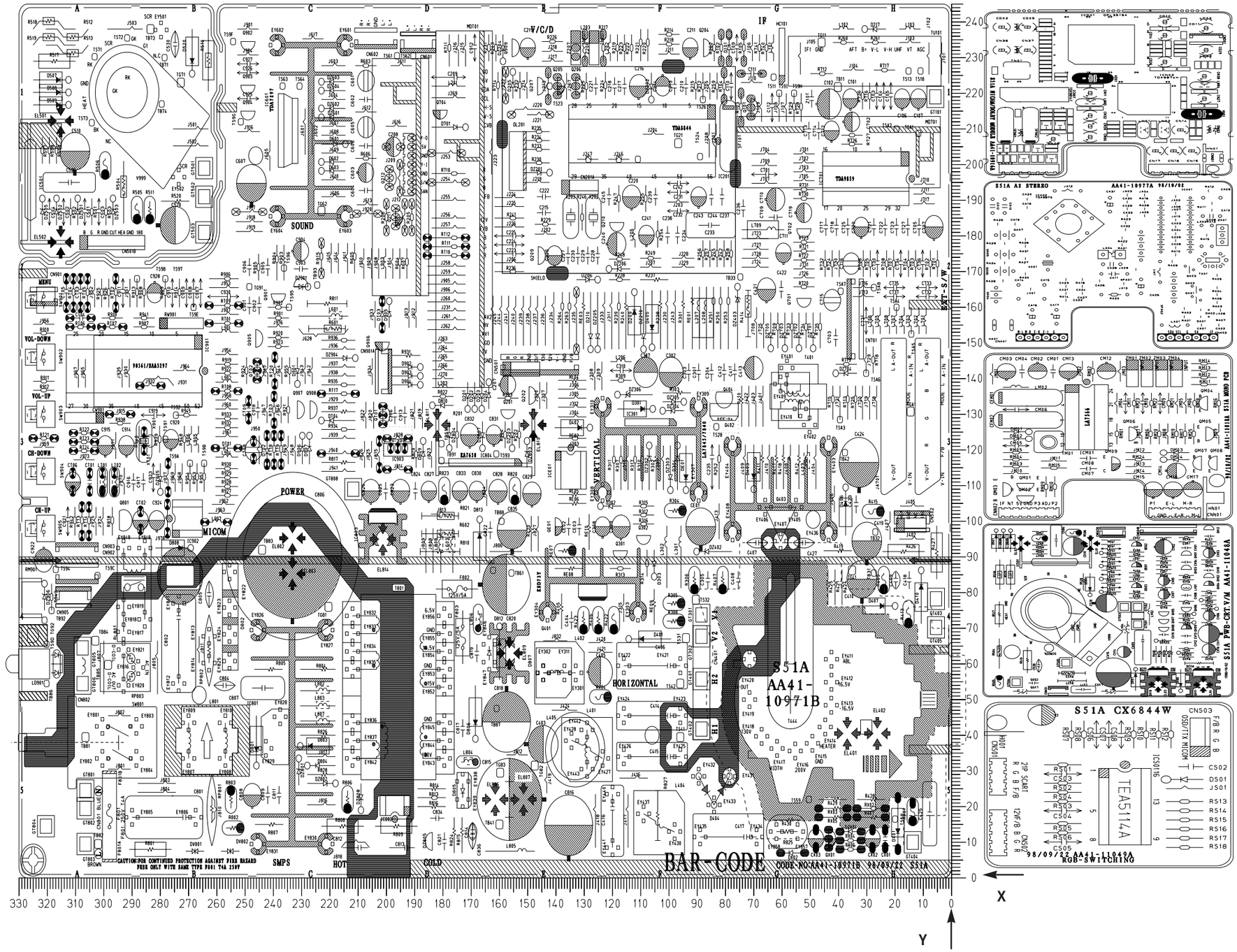
8. Block Diagram

8-1 S51A



9. PCB Layout

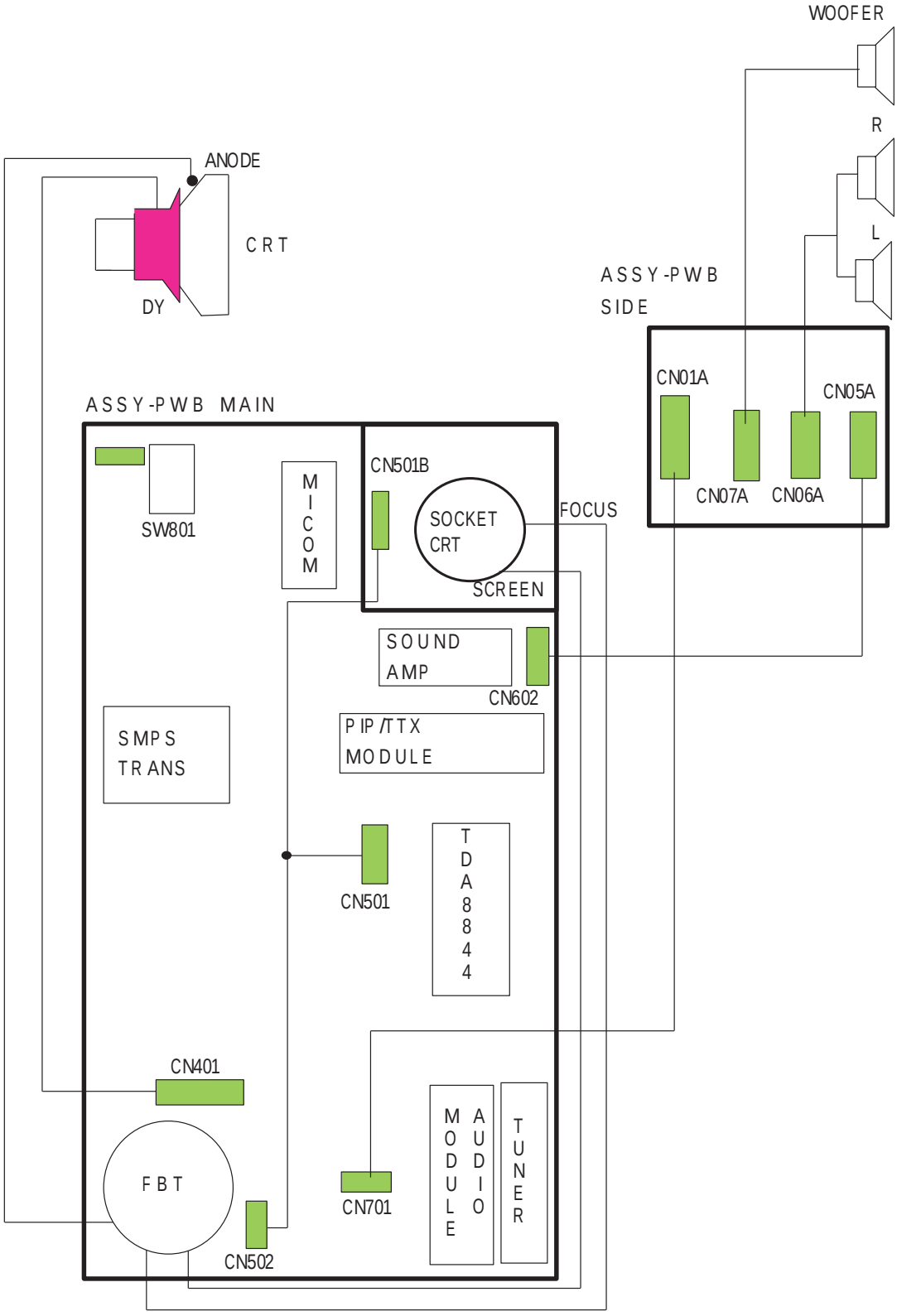
9-1 PCB Main



Loc. No.	X	Y
DIODE		
D101	78	236
D201	171	131
D202	168	131
D203	166	131
D204	163	139
D205	155	226
D206	125	167
D209	112	164
D210	127	148
D217	30	238
D301	105	131
D302	124	104
D303	105	84
D304	97	121
D401	114	67
D402	128	126
D403	70	109
D404	89	28
D405	106	148
D406	37	109
D407	20	76
D410	10	86
D507	312	223
D508	312	220
D509	312	216
D520	268	225
D601	214	205
D602	223	200
D603	223	198
D701	172	210
D801	246	31
D802	255	60
D803	230	37
D804	228	31
D805	173	22
D806	168	39
D807	156	63
D808	269	92
D809	187	122
D810	183	132
D812	160	70
D813	167	100
D901	231	138
D902	188	143
D903	188	140
D904	188	138
D905	199	161
D906	229	124
D907	227	124
DE01	94	108
DL201	155	206
DT01	260	120
DT02	242	116
DT03	201	161
DT04	223	128
DV801	264	7
DV802	251	7
DX01	19	8
DX02	60	7
DZ201	142	197
DZ202	106	218
DZ203	155	120
DZ204	158	229
DZ205	125	148
DZ206	121	170
DZ210	109	148
DZ302	107	121
DZ303	99	108
DZ304	102	131
DZ305	94	133
DZ306	118	135
DZ402	90	91
DZ403	75	165
DZ501	309	190
DZ502	316	190
DZ503	296	190
DZ505	321	190
DZ601	223	213
DZ602	223	215
DZ603	223	223
DZ604	223	220
DZ701	49	148
DZ702	54	148
DZ703	59	148
DZ704	41	141
DZ705	64	148
DZ801	231	33
DZ802	218	26
DZ803	150	122
DZ804	177	120
DZ805	183	12
DZ807	166	120
DZ808	209	19
DZ901	227	165
DZ904	211	145
DZ905	280	108
DZ906	321	82
DZX01	39	13
IC		
HC101	60	224
IC201	85	198
IC301	123	132
IC501	315	178
IC601	238	185
IC701	17	190
IC801	245	9
IC802	201	19
IC803	201	95
IC804	148	127
IC901	267	134
IC902	274	105
IC903	193	120
ICE01	130	118
TRANSISTOR		
Q101	71	213
Q201	159	131
Q202	149	132
Q204	87	230
Q205	139	219
Q206	133	219
Q207	146	219
Q209	146	172
Q210	121	183
Q211	196	182
Q212	199	193
Q301	119	91
Q302	111	96
Q401	143	74
Q402	83	130
Q403	43	97
Q404	83	134
Q701	54	162
Q702	54	182
Q704	183	215
Q801	293	97
Q901	240	163
Q902	251	234
Q903	251	222
Q904	251	215
Q905	246	148
Q906	204	150
Q907	231	128
Q908	227	128
Q909	155	230
QE01	140	96
QT01	201	127
QT02	245	139
QX01	43	8

10. Wiring Diagram

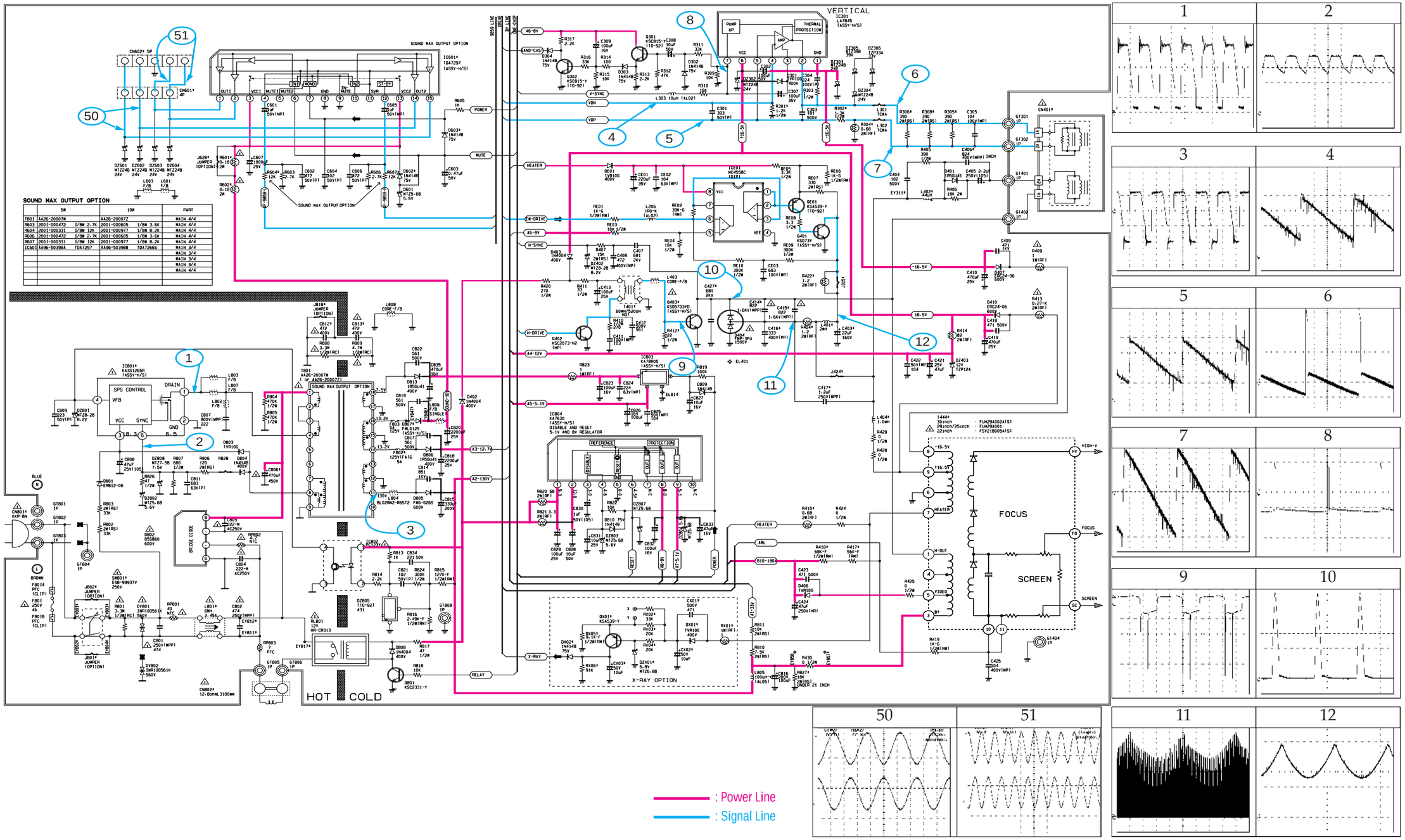
10-1 S51A



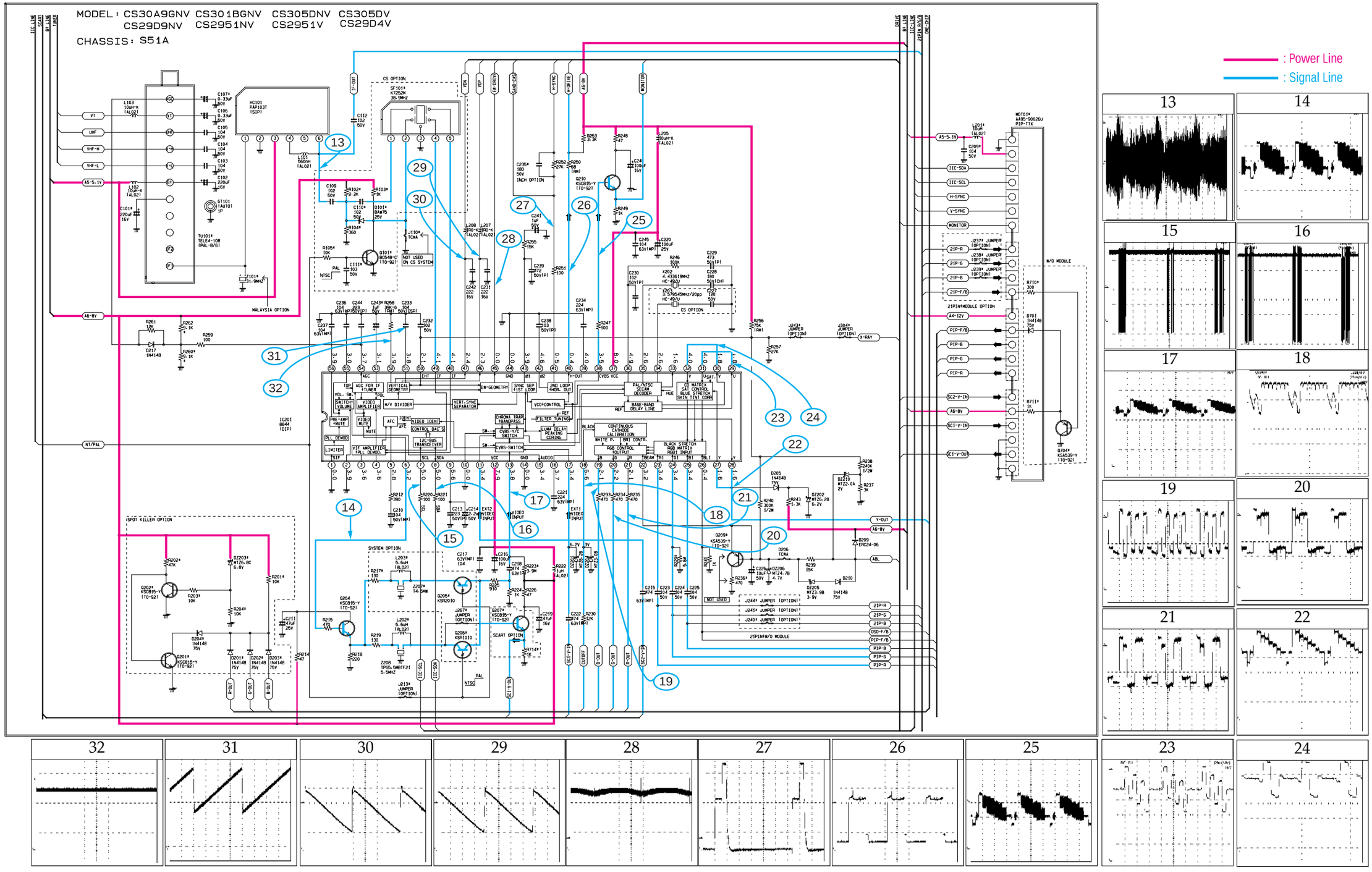
MEMO

11. Schematic Diagrams

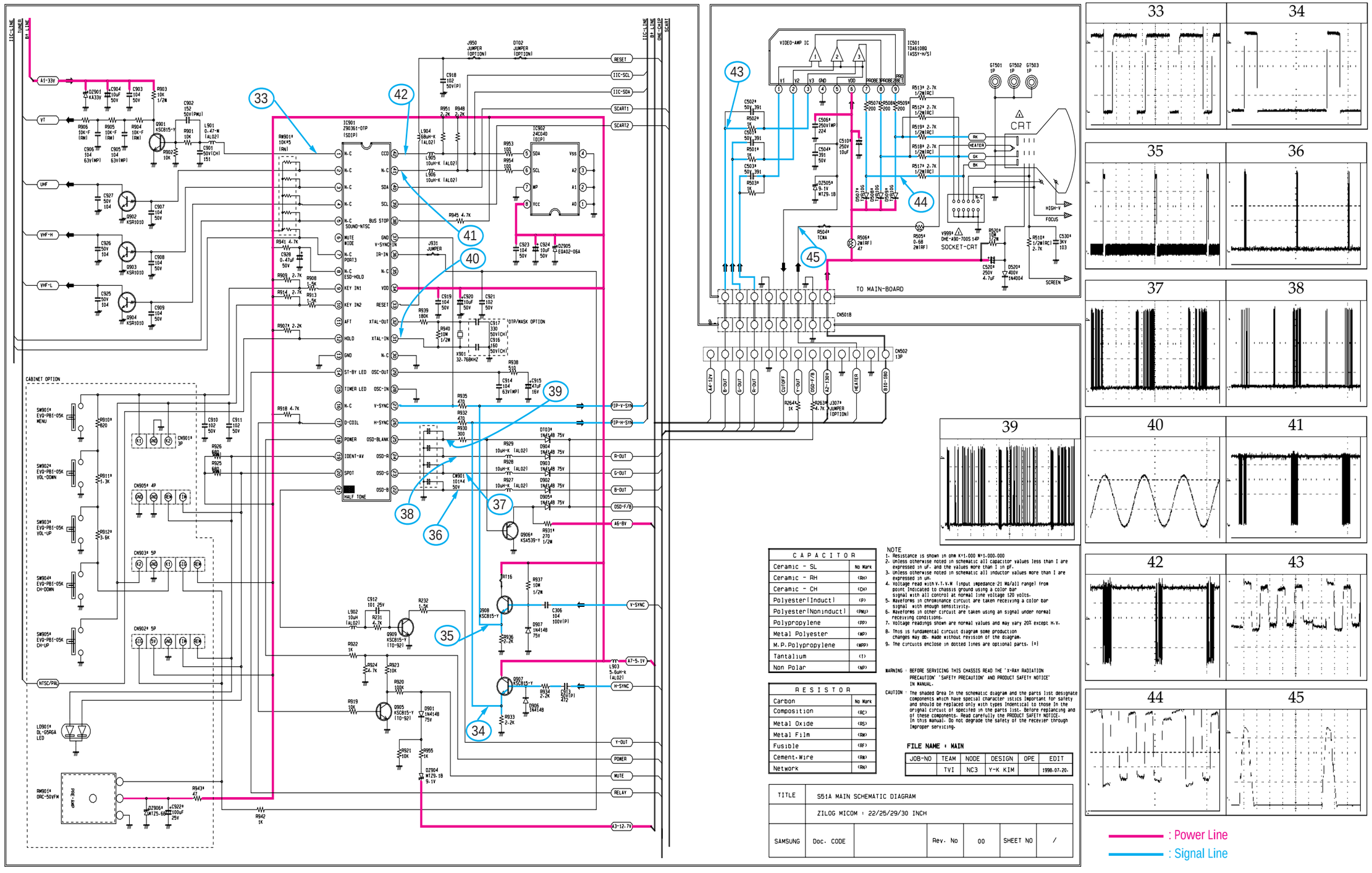
11-1 MAIN (Power)



11-2 PWB MAIN (One-Chip)



11-3 PWB MAIN / CRT (u-COM)



C A P A C I T O R	
Ceramic - SL	No Mark
Ceramic - RH	(RH)
Ceramic - CH	(CH)
Polyester(Induct)	(P)
Polyester(Noninduct)	(PNU)
Polypropylene	(PP)
Metal Polyester	(MP)
M.P.Polypropylene	(MPP)
Tantalium	(T)
Non Polar	(NP)

R E S I S T O R	
Carbon	No Mark
Composition	(RC)
Metal Oxide	(RS)
Metal Film	(RM)
Fusible	(RF)
Cement-Wire	(RW)
Network	(RN)

NOTE
1. Resistance is shown in ohm K=1.000 M=1.000.000
2. Unless otherwise noted in schematic all capacitor values less than 1 are expressed in uF. and the values more than 1 in pF.
3. Unless otherwise noted in schematic all inductor values more than 1 are expressed in uH.
4. Voltage read with V.T.V.M (input impedance 21 MΩ/all range) from point indicated to chassis ground using a color bar signal with all control at normal line voltage 120 volts.
5. Waveforms in convainance circuit are taken receiving a color bar signal with enough sensitivity.
6. Waveforms in other circuit are taken using an signal under normal receiving conditions.
7. Voltage readings shown are normal values and may vary 20% except H.V.
8. This is fundamental circuit diagram some production changes may op. made without revision of the diagram.
9. The circuits enclose in dotted lines are optional parts. (*)

WARNING : BEFORE SERVICING THIS CHASSIS READ THE 'X-RAY RADIATION PRECAUTION' 'SAFETY PRECAUTION' AND PRODUCT SAFETY NOTICE' IN MANUAL.

CAUTION : The shaded area in the schematic diagram and the parts list designate components which have special character istics important for safety and should be replaced only with types identical to those in the orignal circuit of specified in the parts list. Before replancing and of these components. Read carefully the PRODUCT SAFETY NOTICE. In this manual. Do not degrade the safety of the receiver through improper servicing.

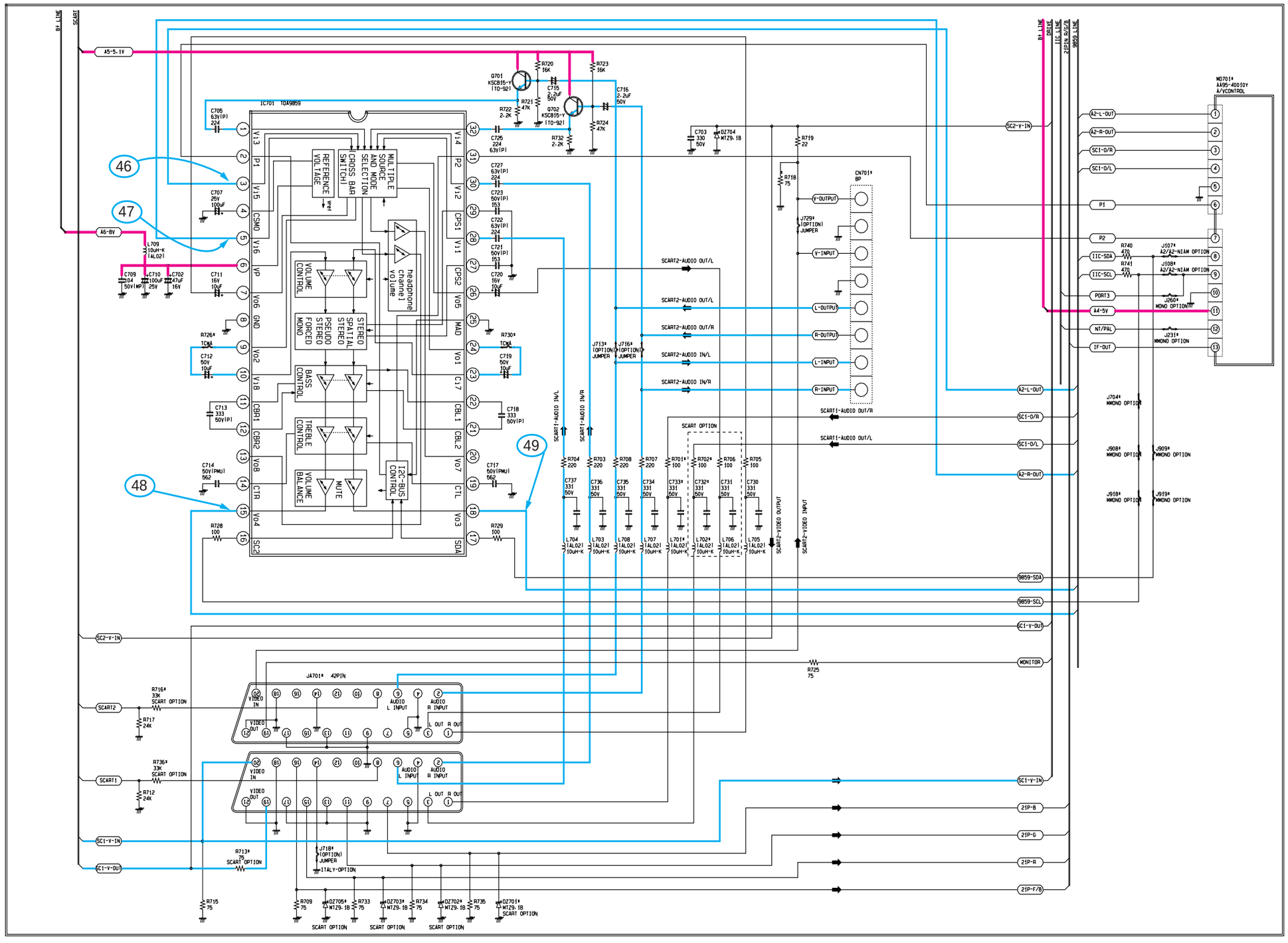
FILE NAME : MAIN

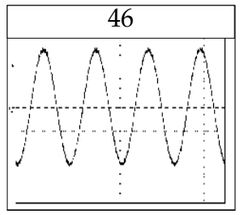
JOB-NO	TEAM	NODE	DESIGN	OPE	EDIT
	TVI	NC3	Y-K KIM		1998.07.20.

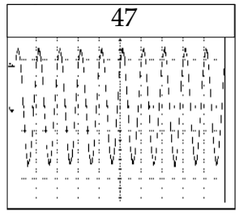
TITLE	S51A MAIN SCHEMATIC DIAGRAM					
	ZILOG MICOM : 22/25/29/30 INCH					
SAMSUNG	Doc. CODE		Rev. No	00	SHEET NO	/

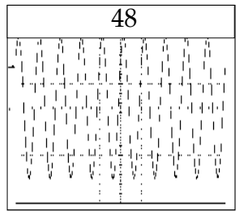
: Power Line
: Signal Line

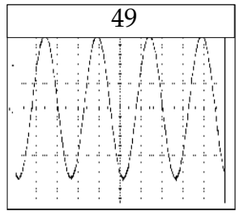
11-4 PWB MAIN (SUB)





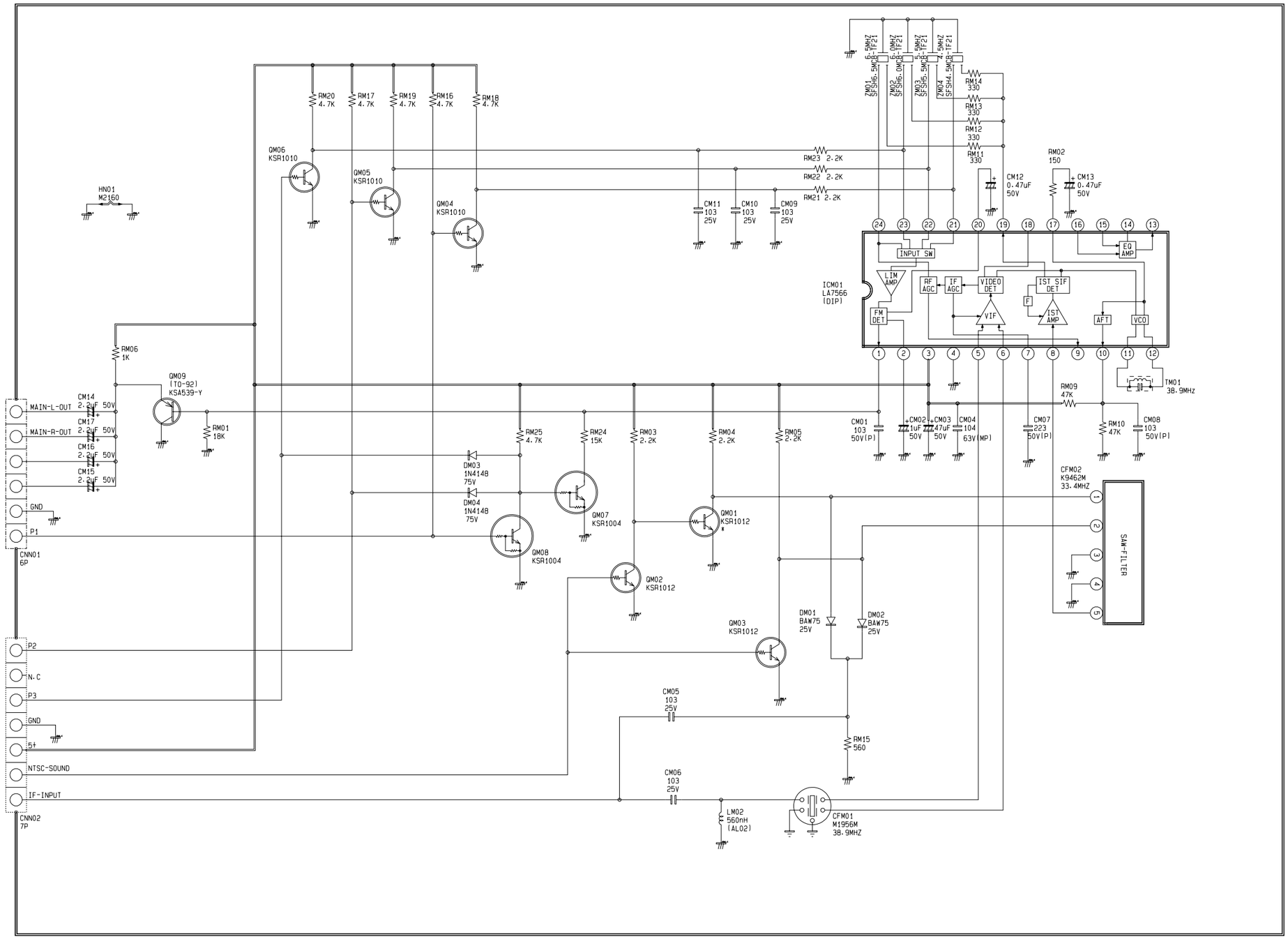




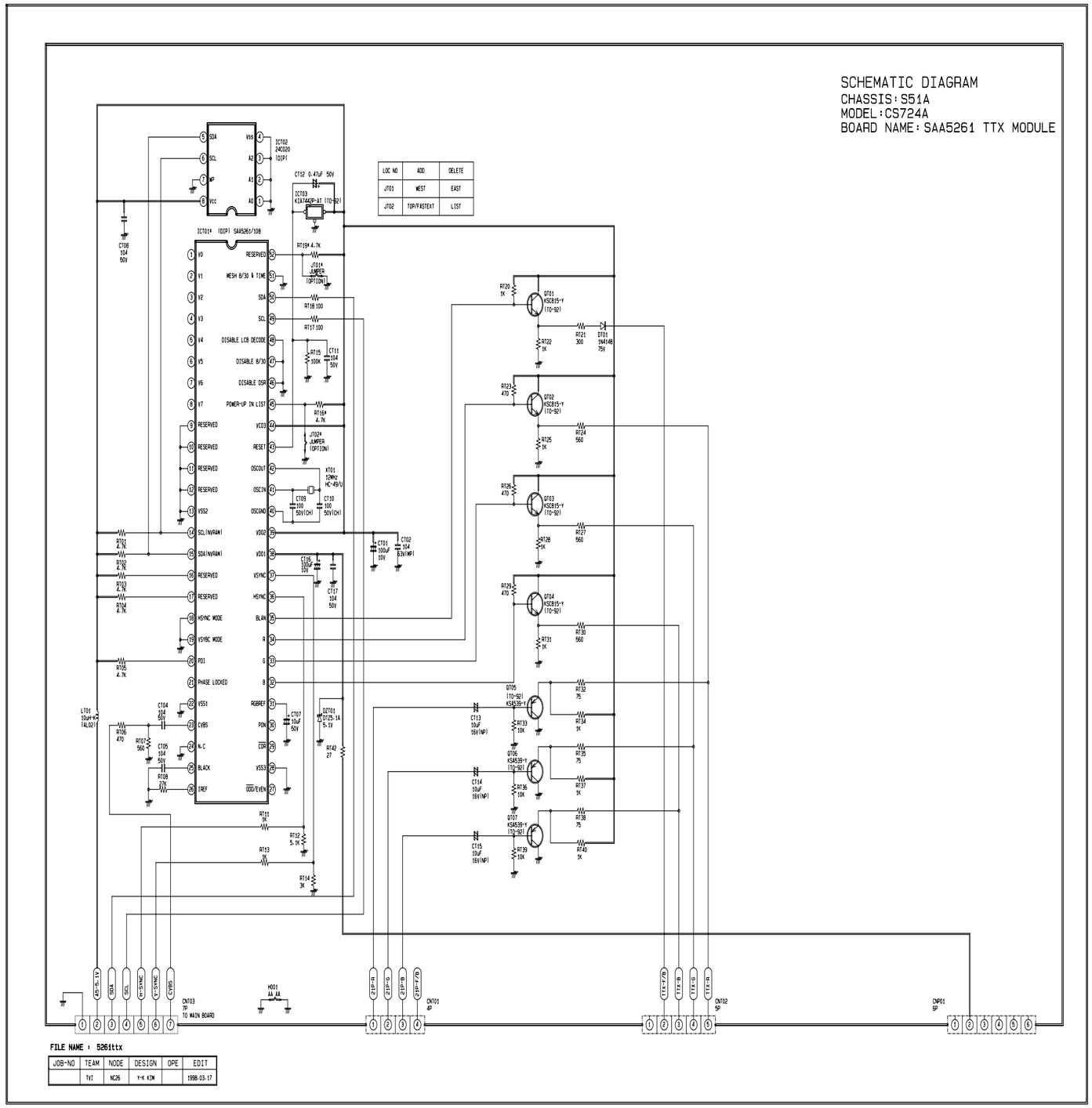


: Power Line
: Signal Line

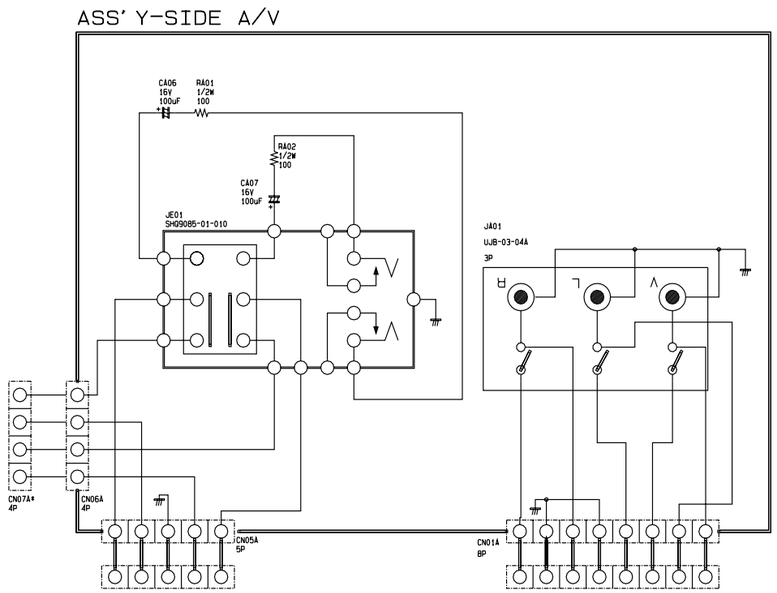
11-5 PWB MAIN (Sound Module)



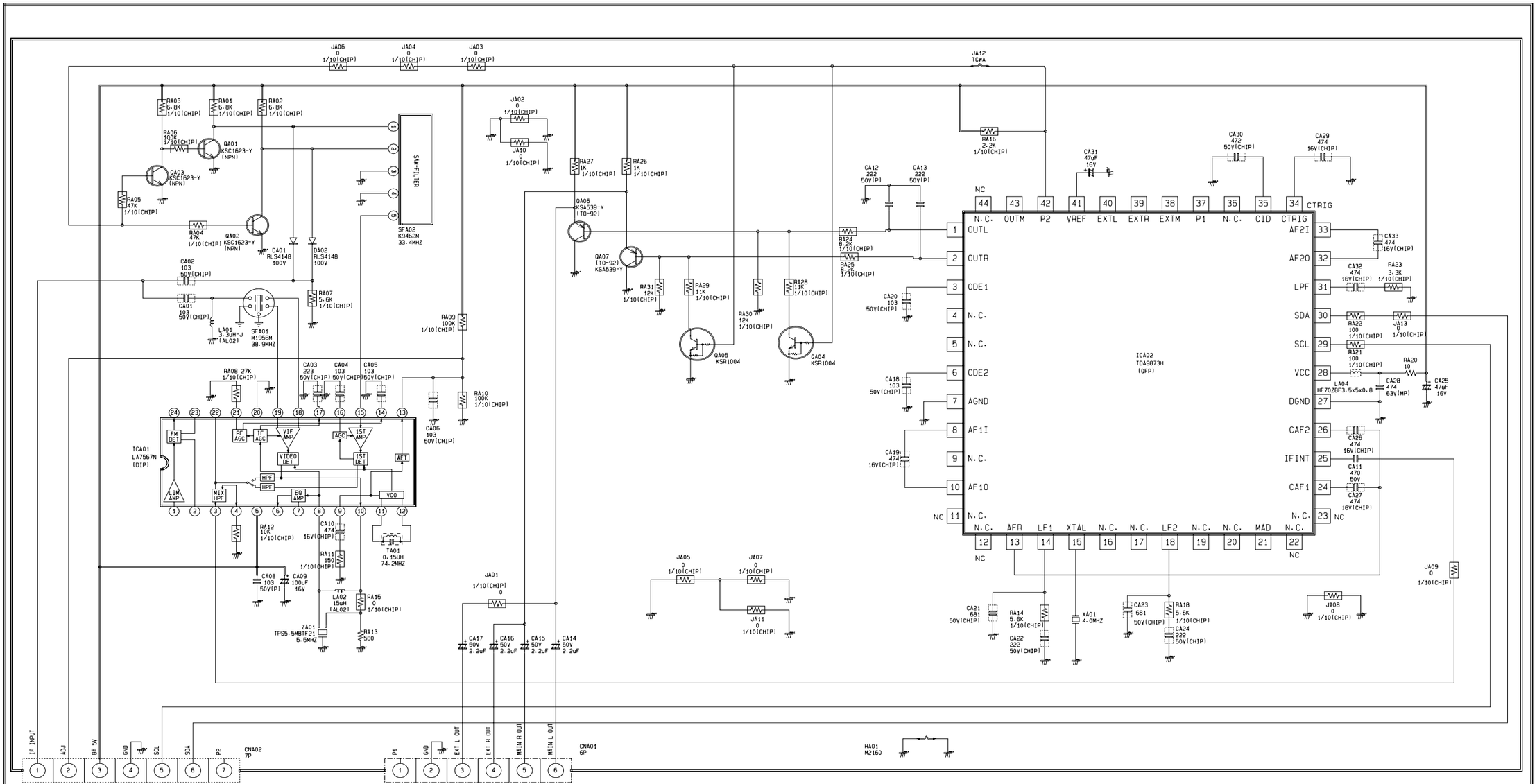
11-6 MICOM (TTX) / A/V SIDE



ASS'Y-SIDE A/V



11-7 PWB MAIN (SOUND MODULE STEREO)



CAPACITOR	
Ceramic - SL	No Mark
Ceramic - RH	(RH)
Ceramic - CH	(CH)
Polyester(Induct)	(P)
Polyester(Noninduct)	(PMU)
Polypropylene	(PP)
Metal Polyester	(MP)
M.P.Polypropylene	(MPP)
Tantalium	(T)
Non Polar	(NP)

RESISTOR	
Carbon	No Mark
Composition	(RC)
Metal Oxide	(RS)
Metal Film	(RM)
Fusible	(RF)
Cement-Wire	(RW)
Network	(RN)

EXPRESSION
1 Resistance is shown ohm K=1.000 M=1.000.000
2 Unless otherwise noted in schematic all capacitor values less than 1 are expressed in ufd. the values more than 1 in pF.
3 Unless otherwise noted in schematic all inductor values areexpressed in uH.and the values less than 1 in mH.

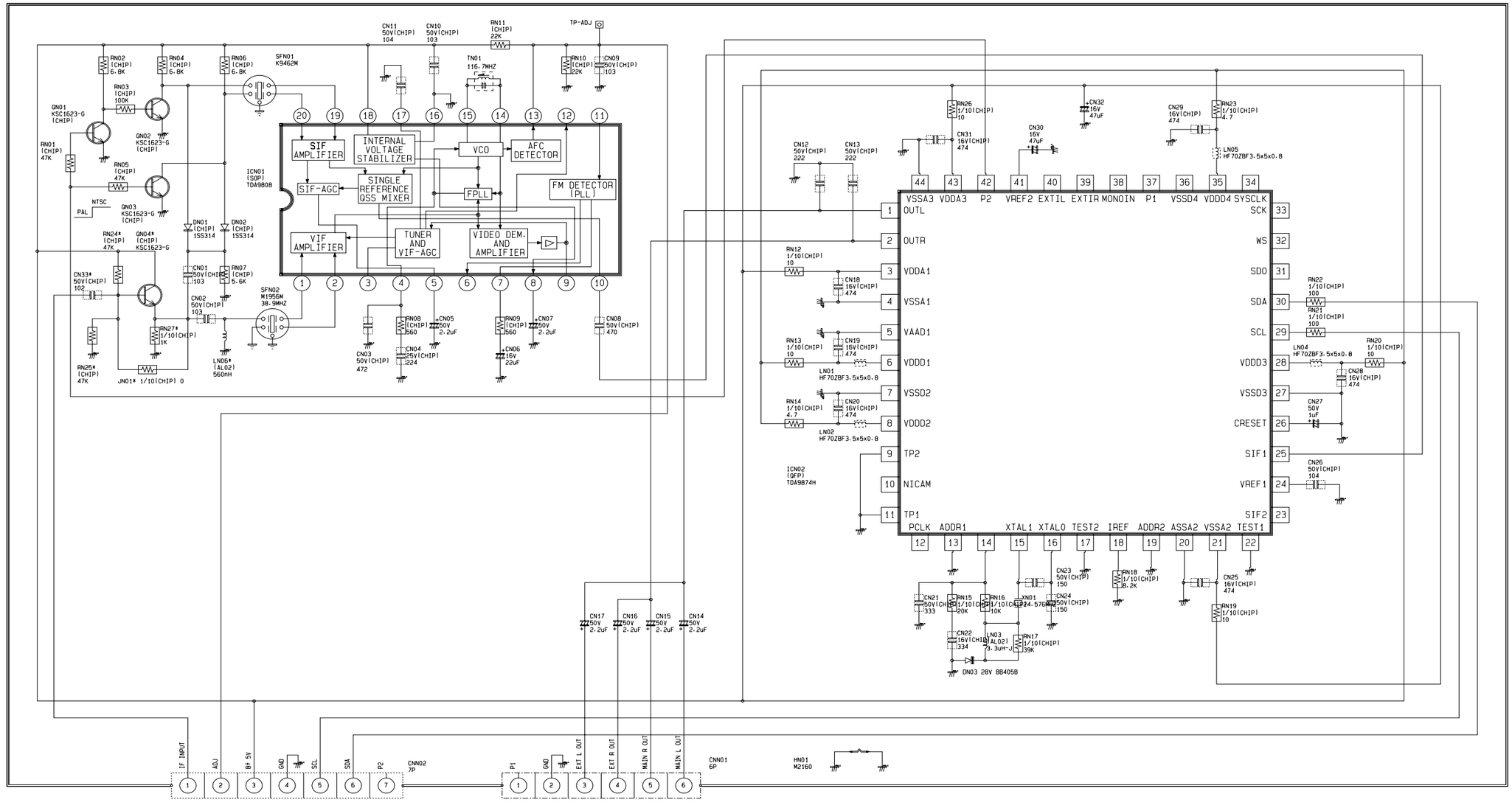
NOTE
The circuits are subject to change without notice to improve the picture quality.

SCHEMATIC DIAGRAM
CHASSIS: S51A
MODEL: CS29D9
BOARD NAME: SOUND MODULE A2 STEREO

FILE NAME : A2

JOB-NO	TEAM	NODE	DESIGN	OPE	EDIT
	T.V.I.	NC20	J.S.RA		1998.08.27

11-8 PWB MAIN (SOUND MODULE NICAM)



CAPACITOR	
Ceramic - SL	No Mark
Ceramic - RH	(RH)
Ceramic - CH	(CH)
Polyester(Induct)	(P)
Polyester(Noninduct)	(PMU)
Polypropylene	(PP)
Metal Polyester	(MP)
M.P.Polypropylene	(MPP)
Tantalium	(T)
Non Polar	(NP)

RESISTOR	
Carbon	No Mark
Composition	(RC)
Metal Oxide	(RS)
Metal Film	(RM)
Fusible	(RF)
Cement.Wire	(RW)
Network	(RN)

EXPRESSION

1 Resistance is shown ohm K=1.000 M=1.000.000

2 Unless otherwise noted in schematic all capacitor values less than 1 are expressed in ufd. the values more than 1 in pF.

3 Unless otherwise noted in schematic all inductor values areexpressed in uH.and the values less than 1 in mH.

NOTE

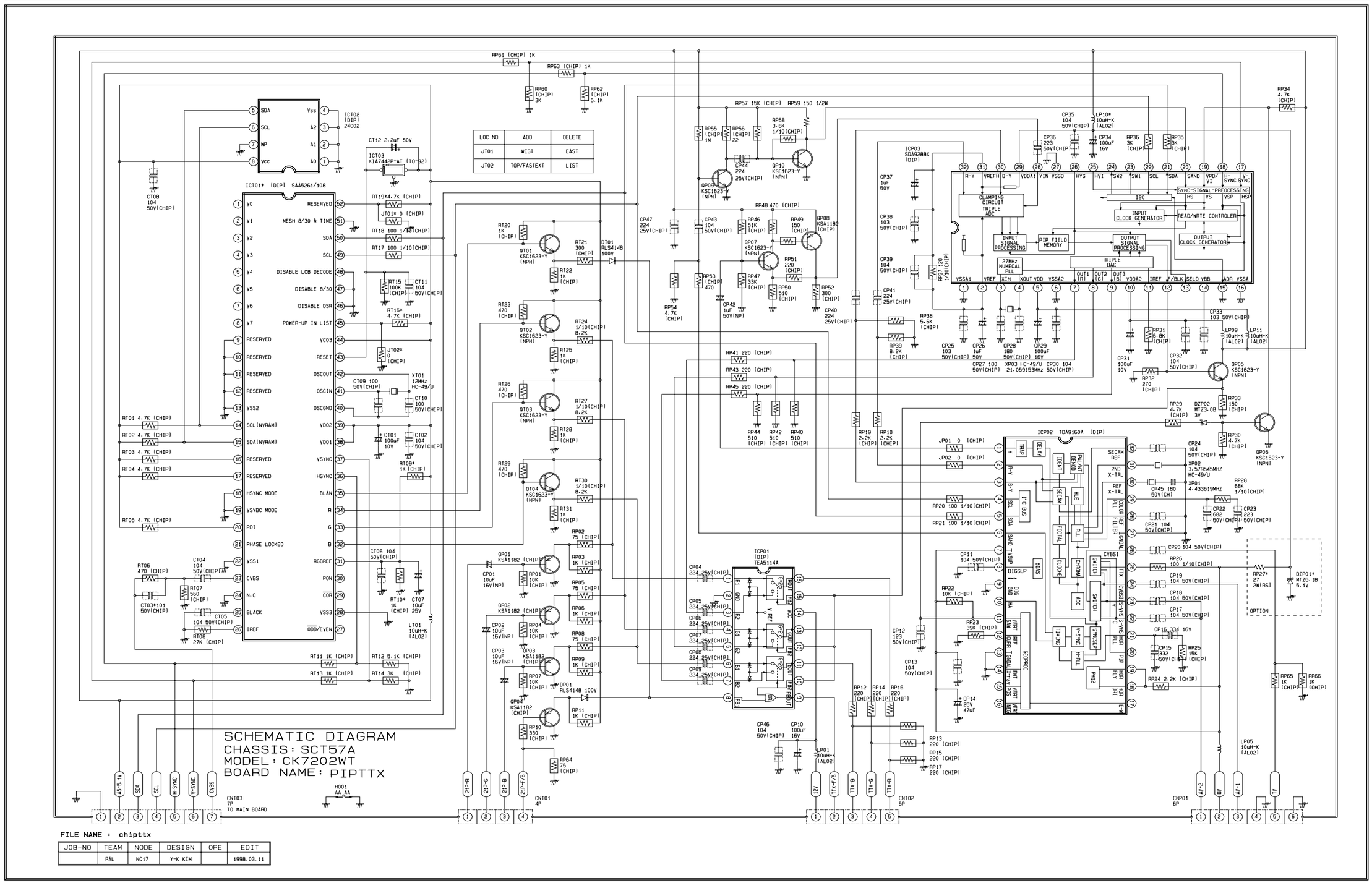
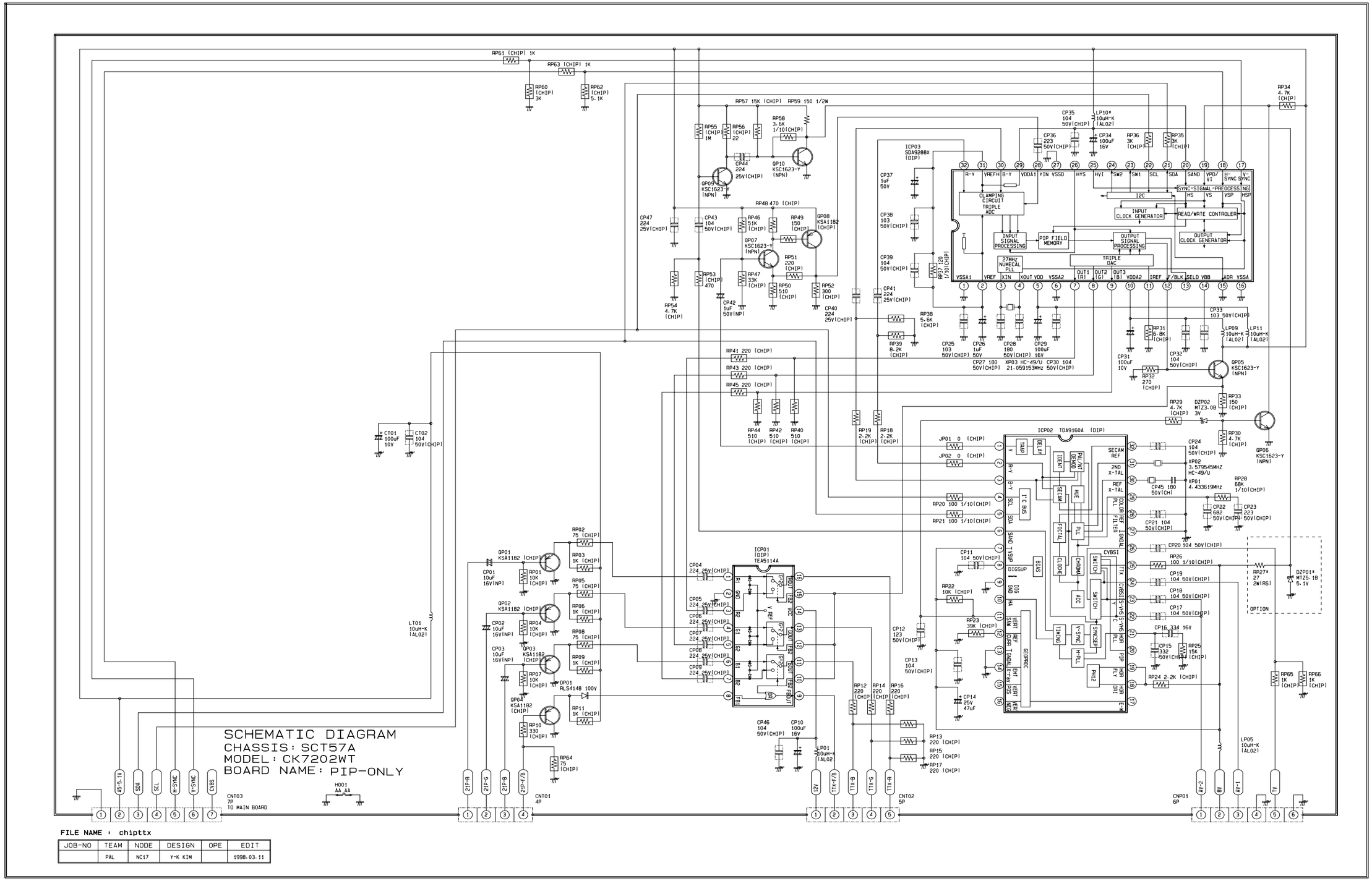
The circuits are subject to change without notice to improve the picture quality.

SCHEMATIC DIAGRAM
CHASSIS: S51A
MODEL: CS72D9
BOARD NAME: NICAM MODULE
A2 NICAM STEREO

FILE NAME : NICAM

JOB-NO	TEAM	NODE	DESIGN	OPE	EDIT
	TVI	NC17	Y-K KIM		1998.08.13

11-9 PWB MAIN (PIP-TTX)



11-10 PWB MAIN (PIP)